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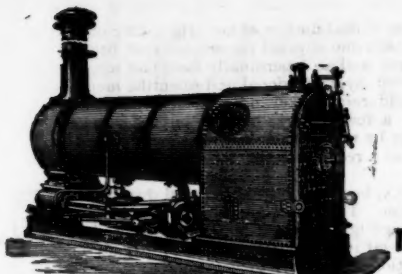

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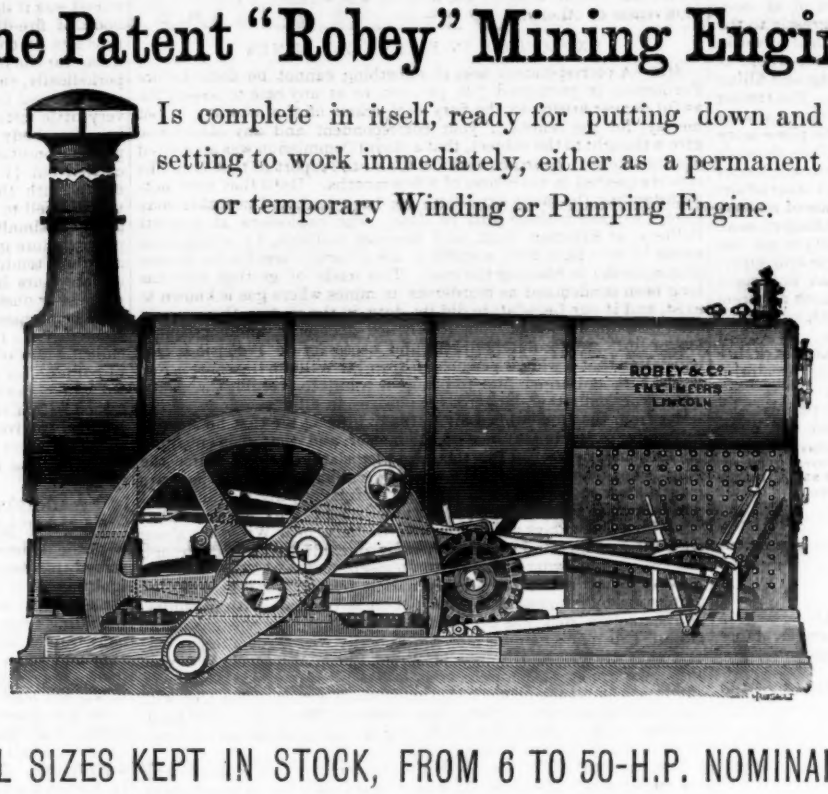

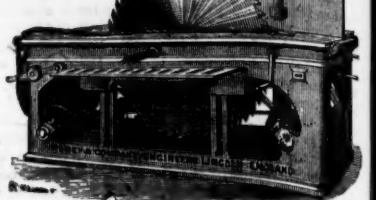

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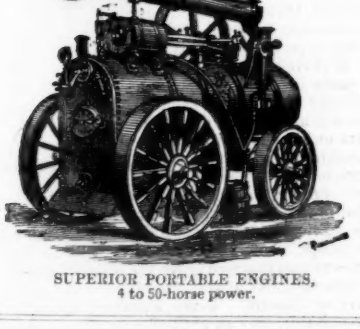

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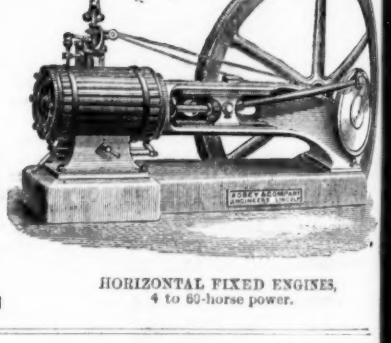

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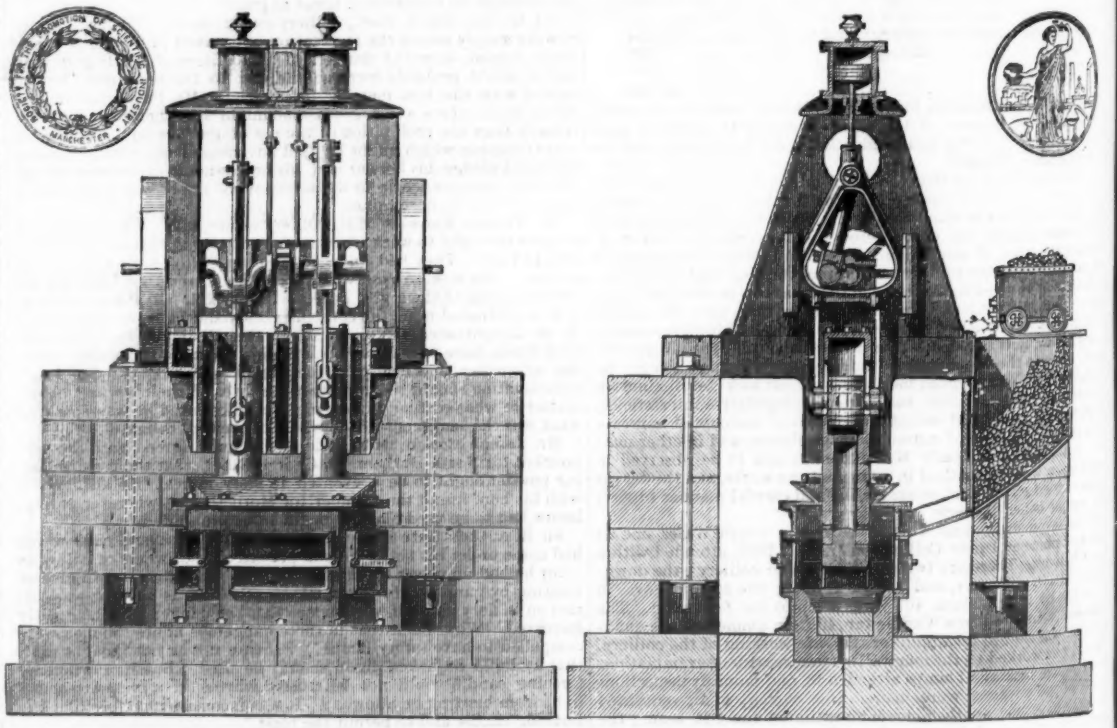

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Original Correspondence.

THE PREVENTION OF COLLIERY EXPLOSIONS—No. II.

SIR,—The loss of life in the year 1879 in mining for coal, fire-clay, ironstone, and shale throughout the United Kingdom was 1 per 149,400 tons of mineral raised. This is the best general result yet obtained, excepting in the year 1876, when the death-rate was 1 per 159,688 tons of mineral raised. The reports from the Inspectors of Coal Mines show that on this mode of comparison the best result in freedom from fatalities in 1879 has been attained in the South Durham district, the ratio being 1 for 309,434 tons of mineral raised. The next most favourable is the Midland district, the ratio being 1 for 300,942 tons of mineral; then the district which includes Northumberland with the northern part of Durham, the ratio being 1 for 256,155 tons. All the other districts are much lower than that last quoted; the least favourable being South Wales, where the death-rate has been 1 for 64,730 tons of mineral raised.

The writer would strongly urge on the consideration of all concerned that division of labour in coal mines conduces greatly to the prevention of accidents. This is exemplified in the method of working in South Wales, where the miner usually performs the whole of the work required in his stall or place, not only in getting and filling coal, but in laying the roads, fixing timber, and brattice. The timber is to be prepared beforehand at the surface, often taking up a large share of his time. Now, the overman may not be in the place more than once during the day, so that the safety of the place depends greatly on the preparations made by the miner, who is too apt, under the circumstances, to neglect the necessary timbering and other affairs requiring attention in his place. The remedy for this state of matters would be to limit the miner's work to the getting and filling of coal, and to appoint deputies (as in the northern coal field) to set the timber, brattice, doors, lay roads, &c., and also give a general supervision over the workmen and lamps. This is really an important matter for consideration, for what has been effected by such a system and better discipline in one district may be adopted with advantage in another, producing proportionately favourable results. By way of showing clearly the different classes of accidents and the loss of life resulting from them, a comparative statement is given for three principal mining districts in England and one in Wales.

Accidents and loss of life, output of minerals, and persons employed in 1879—Northumberland, Durham, Cumberland and Westmoreland:—

	Accidents. Number.	Loss of life.	Output of coal, clay, iron-stone, shale. Tons.	Number employed under and above.	Tons raised per life lost.
Explosions of fire-damp.	1	1			
Falls of stone and coal...	51	52			
Shaft accidents.....	11	12			
Sundries, underground...	46	47			
Do., aboveground.....	8	8			
	117	120	30,738,332	95,437	256,155

This includes two districts of inspection; South Durham, as before observed, standing most favourably in freedom from accidents. The output of coal in Westmoreland was only 2026 tons.

The Midland district, including Derby, Nottingham, Leicester, and Warwickshires:—

Explosions of fire-damp.	1	1			
Falls of stone and coal...	26	26			
Shaft accidents.....	5	6			
Sundries, underground...	7	7			
Do., aboveground.....	7	7			
	46	47	14,144,265	50,923	300,942

Besides these there were 349 non-fatal accidents in the Midland district reported during the year, most of these were falls of roof and coal.

The South Wales district, Glamorgan (in part), Carmarthen, Brecon, and Pembrokeshires:—

Explosions of fire-damp.	7	70			
Falls of stone and coal...	67	68			
Shaft accidents.....	18	25			
Sundries, underground...	24	26			
Do., aboveground.....	6	6			
	122	195	12,622,299	47,964	64,730

In this district the loss of life was 72 more than in the preceding year, the ratio in 1878 being one death for 99,653 tons of mineral raised.

The number employed underground in 1879 was..... 40,344
Do., do., aboveground do. 7,620
Total 47,964

The statistical statements for the other eight districts are nearly on an equality in respect of the ratio of deaths to output of coal, four of the districts being nearly identical with the average for the whole kingdom—149,400.

These statements show that the death rate in the South Wales district is about four times greater than that in the northern counties; but it must be borne in mind that in the South Wales district exceptional disadvantages are encountered in the working of minerals. These are the want of solidity in the roof and floor of the seams of coal, particularly in the southern outcrop of the coal field in Glamorganshire, and the steep inclinations of the measures in that particular district. But the writer is firmly of opinion that were the deputy system adopted in South Wales generally improved discipline would quickly follow, and the death rate at the same time be largely reduced. It is to the constant and hourly supervision of a mine by painstaking and experienced men that we must look for diminution of accidents to the minimum, rather than to legislative interference, though this has to a great extent brought about undoubted improvements in the regulation of mines, their ventilation, and in other matters. In the mines of South Wales there is still to be observed in many cases a want of method in laying out the works, and the details are not carried out in that workmanlike and careful manner observable in some other districts.

Of the seven explosions which occurred in South Wales, one of these took place at Dinas Colliery on Jan. 13, 1879, attended with a loss of 63 lives. There are two pits sunk at the colliery—the downcast is 10 ft. in diameter, and 329 yards deep; the upcast is oval in section (15 by 12 ft.), about 407 yards deep to the 6-ft. seam. The mines were ventilated by a Waddle fan, 40 ft. in diameter; the quantity of air was said to be ample for the safe working of the colliery. The coal was worked on the longwall system, records of examinations were kept, the locking of lamps attended to, and monthly inspections by two of the workmen were made. One current of air ventilated the 2-ft. 9-in. seam; another current ventilated the 4-ft. seam; the two currents afterwards joined and ventilated the 6-ft. seam, in which seam the explosion occurred. The quantity of air passing in the latter in April, 1878, was 44,170 cubic feet per minute. In November, 1878, the quantity had been increased to 64,800 cubic feet, and a month after was 72,750 cubic feet; this was considered to be sufficient in quantity; the mischief was in its not being properly distributed. On an inspection of the 2-ft. 9-in. and the 4-ft. seams in June, 1878, accumulations of gas had been detected in both; this had, however, been remedied in two or three days, indicating that a laxity of discipline prevailed, and that the proper distribution of the air was neglected. The bane of this colliery seems to have been the permitting accumulations of gas to take place. These breaches of the Act had more than once been detected by official inspection. Mr. T. E. Wales's opinion was that the explosion in January originated from an accumulation of gas in a cross measure heading, about 150 yards in length, rising 1 in 7 or 8, which was being driven from the 6-ft. to the 4-ft. seam. The air for the ventilation of this place was conveyed by three iron pipes of 12 in. diameter to the face, only 2½ square feet area; the pipes were so twisted and doubled up by the force of the explosion as to leave no doubt that it occurred there. The pipes were considered to be quite inadequate to the proper ventilation of the heating, and thus an accumulation of gas occurred. How this was ignited there was no means of knowing, shot firing was strictly prohibited, but the primary evil was in permitting an accumulation. Mr. Wales strongly condemned the use of these pipes for ventilation, and trusted the accident would act as a warning against the use of such insufficient expedients.

The proper means for ventilating the heading when the coal was reached would have been either by driving two drifts or by putting in longitudinal brattice, until communication had been made with the up-cast pit. The verdict of the jury was to the effect that the explosion was the result of an outburst of gas in the cross-measure heading. This is quite opposed to Mr. Wales's theory—that the presence of fire-damp was owing to the limited amount of air sent into the heading, only what could be conveyed in pipes of 2½ ft. area in the aggregate. Whether an accidental outburst of gas, or an accumulation of it resulting from defective ventilation, was the occasion of its presence in so large a quantity, the fact is evident that the mine must have been lighted by insecure lamps, or improper use had been made of them, otherwise the explosion could not have occurred. If the quantity of gas issuing from the coal in this heading could have been gauged by a meter, and the limited quantity of air passing through the pipes had been ascertained, the proportion of gas to air would have shown whether the mixture was within the limits of explosiveness or otherwise. —— M. E.

EXPLOSIONS IN FIERY COAL MINES

SIR,—A correspondent asks if something cannot be done before Parliament is prorogued "to prevent, or at any rate to lessen, the awful danger arising in the fiery coal seams of this country." Let me say, for the benefit of your correspondent and any others who give a thought to the subject, that a Royal Commission was appointed shortly after the Abercarne accident, and the report of that Commission is expected in the course of a few months. Until that time, notwithstanding the many explosions we have had, and probably may have, I suppose nothing will be done. The explosions at Leycett Colliery, at Kiverton Park, and Bersham Colliery, by which some scores of lives have been sacrificed, are clearly traceable to the use of gunpowder in blasting the coal. This mode of getting coal has long been condemned as murderous in mines where gas is known to exist, and if our Legislature did its duty in the matter there would soon be a diminution of what are called accidents, and consequent loss of life So absolutely urgent and necessary do I consider this legislation that I waited personally upon Sir William Harcourt a few weeks ago, and urged him to bring in a bill to prohibit the use of gunpowder and other dangerous explosives in all fiery mines. In a letter from the Home Office Sir William informs me that he is painfully alive to the importance of the matter, and that it is engaging his anxious attention. But this is not legislation, and of course the gunpowder blasting goes on while the colliers and their lads are month after month being blown into eternity. Only last Sunday I was talking to the sexton of the little village of Chirk, whose brother was killed a few days ago at Bersham Colliery, near Wrexham, along with the manager and several others by an explosion caused through the use of gunpowder. The sexton himself had worked in the same pit, and he left it because he was in daily fear of losing his life.

Blasting by gunpowder was carried on at Bersham with impunity, and scarcely a shot was ever fired without igniting the gas in the mine. This man's name is Joseph Roberts, who is at present employed as a collier at Brinkinalt Colliery, Chirk, also acting as sexton and apparator at the church. His brother leaves a wife and seven children, and all the others killed at Bersham were married men with families, but not one of them was insured. More than 1000 hard-working colliers are killed every year in the coal mines of Great Britain, many of them from preventible causes.

The substitution of some other and safer agent than gunpowder has engaged my attention for many years, and has cost me many thousands of pounds. Such a substitute is now perfected and ready to be applied. The agent is compressed air, and the blasting of coal in the most fiery mines can be accomplished without risk of explosion. Indeed, instead of powder, smoke, and flame from the firing of a shot, there is no flame at all, but an abundance of fresh air is released into the working place at every blast.

Government Inspectors of Mines have frequently expressed their strong condemnation of the use of gunpowder, and members of Parliament, some of them colliery proprietors, have spoken in favour of its abolition. Let me give you a few instances which I hope will show the force of my argument. Mr. Thomas Burt, M.P., said: "Blasting should be entirely prohibited wherever it was absolutely necessary that the safety-lamp should be used. It was absurd to hedge about a small flame of less than 1 in., and to deal recklessly with a flame which might be hundreds of times as great."

Sir George Elliot, Bart., colliery owner, said: "The use of gunpowder simply meant the application of a naked light, which was of itself a great source of danger. The abolition of blasting in fiery mines would probably increase the cost to the consumer; but he agreed with the hon. member for Morpeth (Mr. Burt) that in coal mines where there was a great amount of gas there was no other remedy than the prohibition of the use of gunpowder. There were other remedies which might be used advantageously, but the remedy he would pledge his honour and his professional experience to that House as best conducive to the safety of the miner was the abolition of gunpowder in fiery mines."

Mr. Thomas Knowles, M.P., colliery owner, said: "No man ought to have the right to work when it was not safe to have a naked light and to blast. They had an accident near Bolton some time ago in a mine. The men worked with naked lights, and they blasted coal, but every one of them was killed. If an explosion should occur in a well-ventilated mine the consequences would be more serious than in an ill-ventilated mine. Bitter as the pill might be to swallow they would have to consider the question of doing away with blasting altogether, and also with the use of naked lights. Their first consideration should be to protect the lives of their workpeople no matter at what cost, and in saying this he believed he was speaking what was the sentiment of the whole of the coal owners."

Mr. Joseph Cowen, M.P., said: "He quite agreed with the hon. member for North Durham, Sir George Elliot, that the use of blasting powder ought to be prevented in fiery mines. He also agreed with his hon. friend the member for Morpeth that wherever safety-lamps had to be used blasting ought to be prohibited."

Sir R. A. Cross (late Home Secretary) said: In several cases which had come under his notice he had pressed on the owners of collieries—for he had no power to interfere further—that they should give up blasting by gunpowder in fiery mines. So long as blasting was carried on in fiery mines it was obvious that the danger must be greatly increased. Why was it that in those dangerous mines the men were compelled to have safety-lamps? Because it was not thought right that a candle or naked light should be used. But if a wretched farthing candle could not be trusted why could a great stream of light from blasting be allowed? It was inconsistent to prohibit the farthing candle and to permit the blast."

Mr. A. Macdonald, M.P., said: "When you blast under any circumstances, or use powder for blasting where gas is, you are bound to create a flame a thousand times larger—aye, it may be 10,000 times larger—than the light of the naked lamp you have prohibited. The shot itself may liberate an immense quantity of gas that no human eye can see. To my mind, the precautions now in operation look like a burlesque rather than a sincere desire to prevent accident through the use of gunpowder. It is clear to me that until the use of blasting powder be prohibited in every fiery mine we will have those terrible disasters recurring again and again."

I have before me a list of colliery explosions, the evidence of the inspectors or other witnesses who were examined, showing very clearly that shot firing or blasting by gunpowder led to the disaster, causing the deaths of a number of men, as follows:—Ince Hall, Wigan, 89 lives lost; Bryndu, South Wales, 12 lives lost; Ruabon, North Wales, 13 lives lost; Clough Hall and Brookhouse, 5 lives lost; Lower Dufferin, Aberdare, 3 lives lost; Garswood Park, Lancashire, 14 lives lost; Highbrooks Colliery, Wigan, 37 lives lost; Oldfield Colliery, 2 lives lost; Low Hall, Wigan, 27 lives lost; Hindley Green, Wigan, 6 lives lost; Ince Hall, Wigan, 54 lives lost; Swaithemaine, Barnsley, 143 lives lost; Pemberton Colliery, 36 lives lost. The above are only a few cases out of many.

In conclusion let me say that during the last 25 years I have seen the dead bodies of many hundreds of colliers, some of whom had been suffocated by the after-damp of an explosion, but many who had perished by the blast itself, and whose mutilated and blackened remains I shall never forget. The protection of the lives of the 500,000 men who have to work in darkness and danger, and at the present time for very scanty wages, ought to be the first duty of the Legislature.—*Bowdon, Aug.* 17. —— ELLIS LEVER.

COAL DUST—COLLIERY EXPLOSIONS.

SIR,—The influence of coal dust in either originating or augmenting colliery explosions is one of great importance and interest to the mining world at large; and as I personally have had some share in experiments conducted by professional and scientific men on dusts collected in many different seams and districts, you will, perhaps, allow me space for a few remarks bearing on the subject. I am led to this especially by noticing in last week's Journal the report of the proceedings at a recent meeting of the North Staffordshire Mining Engineers.

It has never, I think, been suggested that coal dust *per se* could *originate* an explosion. The only question ever sought to be determined was if it, through ignition by a blown-out shot or by a small body of fire-damp itself in combustion, would propagate flame and products of combustion sufficiently to account (to some extent at least) for the overwhelming catastrophies which unaccountably, but periodically, cause damage, devastation, and distress in so many of our own coal fields. I myself believe that in a warm and dry seam very little initial heat may suffice to spread over a large area an immense body of flame and an enormous alteration in the atmospheric condition of a mine; but as experiments are still being carried out (I believe more or less under the direction—or, at all events, with the concurrence—of the Royal Commission itself), it may be well to allow the full reports of these experiments which are going on simultaneously in the North and in Derbyshire to be made public before generalising. In the meantime, I would suggest that any facts tending to show whether any serious explosion has occurred of late years in seams where the condition was dampness, and not dryness or dust; or if in most cases, if not all, powder was not at the time being used either in the coal workings themselves, or at least in stone drifts. If you, Sir, through the medium of your paper could collect a few of such statistics without implicating any names either of collieries or individuals, merely referring to districts, I believe the work of experimenters might be simplified, and perhaps the causss traced with a view to eventual remedy, if not prevention. I should be glad to give any informatian to those willing to contribute to the elucidation of a problem of such importance. D. P. MORISON.

Collingwood Chambers, Newcastle-on-Tyne, Aug. 16.

COLONEL SHAKESPEAR ON SAFETY-LAMPS.

SIR,—The Belgian Commission of ten years ago was acquainted with the danger of the horizontal gauze and chimney, as they observed that under certain conditions flame passed both, and then igniting gas in the gauze cylinder rendered an explosion inevitable if the current was sufficient to fan the gauze to red heat. But whilst recording those occurrences they say "only a few explosions were caused in experiments of this kind." Only a few, mark you! Yet as they adopted a lamp, the Mueseler, with the chimney and horizontal gauze, they could have done so, not because it was safe, but because it was the least treacherous.

In the Journal of April 26, 1879, I pointed out that "The Protector" had fired in my test-box twice in 20 trials. Since then I have found all lamps of that type fire outwards if the circumstances are suitable. The reason is obvious. It is now being urged by some that when the chimney is made in certain proportions, which seems to mean more conical and smaller at the top, such lamps are safe, as flame will not pass up it, so it is alleged. But the choke in the chimney so produced throws pressure on the horizontal gauze, and thus simply transfers the risk from the chimney to that gauze. It stands to reason that whether pressure is produced in the combustion chamber by internal incipient explosions or by external atmospheric influences there must be a vent for that pretty blue lambent flame, so well known to all conversant with the subject; either it will extinguish, as it generally does, or it must escape, if not up the chimney, through the horizontal gauze. Both theory and practice prove the risky nature of the Mueseler form of construction, but at the same time it is a much safer lamp than the Davy or Clanny. Given suitable fire-damp, with heat and pressure also suitable, and an explosion must follow as a matter of course when chimnies are in use.

Barons Court, Aug. 18. J. D. SHAKESPEAR,
Assoc. M. Inst. C.E.

CORNISH STAMPS FOR HOT COUNTRIES.

SIR,—I have just been reading the specification of the invention recently patented by Mr. C. J. Appleby, of Cannon-street, in connection with improvements in Cornish stamps, the object of which appears to me to be to render them more durable in hot countries where wooden framing and boxes are inapplicable, but it seems to me that he claims the use of metal as a substitute for wood, and inasmuch as I, and no doubt many others, have long been accustomed to recommend metal, though we did not think it worth patenting, what I should like to know is whether this subsequently taken patent would prevent the free use of the same arrangements that we have hitherto used should Mr. Appleby's specification happen to mention them. He states that he takes ordinary stamp-heads attached to the lower ends of vertical spindles or shafts which are raised to a sufficient height, and then allowed to fall by means of cams or other suitable devices actuated by steam, water, or other power in the ordinary well understood way. These stamp-heads are arranged to fall upon blocks fitted in boxes into which the material to be pulverised is to be fed. Each of these boxes may be arranged to receive one or more stamp-heads as may be desired. He adds that he makes the lower part of the box of sufficiently tough metal, preferably cast steel, the bottom being of considerable thickness, and the sides being thinner and preferably tapering to still less thickness at their upper part, where the box has consequently a larger area of opening in plan, and where a horizontal flange is formed upon which is bolted or fixed a corresponding flange at the lower edge of the upper part of the box.

It was upon my recommendation many years since that the late Mr. John Walker, of Cowper-street, City-road, supplied stamps with metal boxes and frames for a company which proposed to use them in Central America, and they worked admirably, so that it would be a little annoying if a new patentee should now interfere with their free use. Mr. Appleby states that he makes this upper part of the box preferably of wrought-iron plates, an opening being formed at one of the sides connected with a hopper through which the material which is to be pulverised is supplied, and an angle iron being rivetted round the inside of the upper edge of the box. On one or both sides of the lower part of the box described he makes an opening to which is fitted a moveable frame containing perforated plates or gauze, either vertical or inclined, through which the material when reduced to a sufficiently small size is discharged, and carried away by spouts or shoots attached to supports formed upon the boxes, the process being aided by the addition of water which is supplied to the box. Then we come to what really does appear to be a novelty, the arrangement inside of this box of a movable plate or anvil block, preferably of cast-steel, under each stamp head. The apparatus, he says, being composed of separate pieces which can be readily removed or replaced is very portable, and can conveniently be fixed and used in positions where such stamping machinery as ordinarily constructed cannot be taken or fixed.

The making of the foundation is also good, and, so far as I know, is an improvement upon anything I have seen. He says that he prefers to use timber piles of sufficient size, and driven for a sufficient distance into the ground, to withstand the blows of the stamping machinery, and upon the heads of these piles, which are made flat or level, he fits one or more horizontal slabs or plates of wrought-iron, to which the lower boxes already described are firmly attached by bolts or rivets passing through the bottom of the box, or through lugs cast upon the box, and through the several slabs or plates of wrought-iron. In order to retain the slabs carrying the stamp boxes in their proper position upon the heads of the piles, he uses side

plates, preferably of wrought-iron, embracing both the slabs and the piles, and fixed by bolts or rivets passing through them and through the latter, and in this way he obtains a very solid and firm foundation for the stamping machinery, whilst at the same time each of the several parts comprising it is of moderate weight and easily carried, and the whole are readily and simply put together and adjusted and fixed in their places when required. Each stamp-head may fall in a separate box, or the stamps may be arranged in groups of two or more, one box being provided to receive each such group.

That stamps constructed as Mr. Appleby proposes would work well I do not for a moment doubt, but the question is as to what are to be considered the special features of novelty, and as to whether the patent would interfere with almost identical arrangements adopted years since by— ——— An Engineer.

HEAT OF THE COMSTOCK LODE.

Sir,—In May, 1878, Mr. Church, who was at that time Professor of Mining at the University of Ohio, read a paper before the American Institute of Mining Engineers on the heat of the Comstock mines, which was subsequently, in an extended form, included in the author's volume on the Comstock lode, of which a review appeared in Nature (vol. xxi. p. 511).

In this paper Mr. Church states that the temperature of the waters issuing from the mines worked upon the Comstock lode has always been somewhat high, but it was not until they had attained a very considerable depth below the surface that the workmen first became inconvenienced by extraordinary heat. At their present greatest depth (about 2700 ft.) water issues from the rock at a temperature of 157° F. (70° C.), and at least 4,200,000 tons of water are annually pumped from the workings at a temperature of 135° F. Mr. Church estimates that to elevate such a large volume of water from the mean temperature of the atmospere to that which it attains in the mines would require 47,700 tons of coal. In addition to this he calculates 7859 tons of coal would be required to supply the heat absorbed by the air passing along the various shafts and galleries through which it is diverted for the purposes of ventilation. It follows that to develope the total amount of heat necessary to raise the water and air circulating in these mines from the mean temperature of the atmospere to that which they respectively attain 55,560 tons of coal or 97,700 cords of firewood would be annually required.

Mr. Church in his paper quotes four analyses of waters from the Comstock lode taken at different depths; these vary somewhat as to the relative proportions of the various substances present, but they contain on an average 42·62 grains of solid matter to the gallon. Of this amount 20·74 grains are calcic sulphate, 12·13 gains carbonate of potassium, 4·85 grains carbonate of sodium, and ·66 grain of chloride of sodium. In order to ascertain approximately to what extent the production of the large amount of heat absorbed by the water may be ascribed to oxidation of sulphur and iron, the author first calculates the quantity which would be developed by the oxidation of pyrites equivalent to the calcic sulphate in solution. But having found that this amounts to only about 1-150th part of that required, he seeks another solution for the difficulty, and without any calculations in support of the hypothesis attributes this enormous development of heat to the kaolinisation of felspar in the subjacent rocks.

In a communication to the Geological Society of London, published in their Quarterly Journal, August, 1879, entitled "A Contribution to the History of Mineral Veins," I endeavoured to show that the kaolinisation of felspars is as inadequate to produce the effects observed as is the oxidation of pyrites, and a recent paper read by Mr. Church before the American Institute of Mining Engineers, as well as his letter on Subterranean Kaolinisation in last week's Nature, have been written with a view of answering these objections. In my communication to the Geological Society I applied to the kaolinisation of felspars a similar line of reasoning to that adopted by Mr. Church with regard to the oxidation of pyrites.

The average proportion of alkalies contained in the rocks of the district is 6·40 per cent., while the mean of the published analyses gives 11·30 grains of alkalies in the U. S. gallon of water. It follows that the 4,200,000 tons of water annually pumped out must contain 813 tons of alkalies, and that as these are present in the rocks in the proportion of 6·40 per cent., the felspar in 12,703 tons of rock must be annually kaolinised, and the alkalies removed in solution.

The amount of rock in which the felspar has been kaolinised being 12,703 tons, and the number of tons of water pumped out of the mines 4,200,000, it follows that $\frac{4,200,000}{12,700} = 330$ is the number of tons of water heated by each ton of completely altered rock.

In order, therefore, that 1 ton of rock should be enabled to heat 330 tons of water only 1° Fahr., and the specific heat of these rocks be taken at ·1477—that of blast-furnace slags—it would require to be heated by the kaolinisation of its felspar to a temperature above that of molten gold. Consequently to raise the water 85°, or to a temperate of 135°, at which it issues, the kaolinisation of the felspar in each ton of rock would require to elevate it to an extent it would be difficult to estimate. To this Mr. Church, who derives his heat from the hydration of silicaie of aluminum during the formation of kaolin, objects that the whole of the alkalies liberated by the decomposition of felspar do not become dissolved in water, and that their amount cannot consequently be taken as a measure of the quantities of that mineral which have been decomposed. In support of this argument he states that clays from the immediate neighbourhood of the Comstock lode still contain above 4½ per cent. of alkalies, and ignores the fact that the final result of kaolinisation is the production of a hydrated silicate of aluminium free from alkalies. The clays in question must consequently be regarded as containing undecomposed felspar, which cannot have contributed to any increase of temperature. Admitting, however, for the sake of argument that all the felspar has been decomposed, and that three-fourths of the alkalies present have been retained by the resulting clay, the heat corresponding to the decomposition and hydration of the felspar in a ton of rock must be reduced by three-fourths. If, therefore, as before to simplify our ideas, we regard the heat required to produce the observed effects as due to a single variation of temperature, the original temperature must have been about twenty times higher than the melting point of gold, which appears as improbable as that found on the assumption of the whole of the alkalies entering into solution.

The assumption now made—that much of the kaolinisation of the felspar is accomplished by aqueous vapour which is entirely absorbed by the rock, and which does not give rise to any aqueous solutions—involves conditions of which we have no known example, and of which it is difficult to conceive the existence at such great depths below the water-level of the country. This view of the question was not advanced by Mr. Church in the original paper of 1878, and has probably occurred to him subsequently to the publication of my observations in the Quarterly Journal of the Geological Society in the following year. If, however, the possibility of such an alteration were admitted it certainly could not be ascribed to kaolinisation, since the removal of the alkalies in felspars is an essential factor in that transformation.

With regard to the hot spring which formerly issued from between slate rocks and an elvan dyke at Wheal Clifford, in Cornwall, containing notable quantities of chloride of lithium and other alkaline salts, cited by Mr. Church in his recent pamphlet in support of his views with respect to kaolinisation, the effect has probably been taken for the cause. Hot water is known to be a better solvent of mineral matter than cold water, and it has been shown by Daubrée that at high temperatures and under great pressure it is even capable of rapidly dissolving silica out of glass, and of leaving it in the form of crystallised quartz.

We have no direct evidence that the dissociation of the constituents of felspar and the subsequent hydration of the clay produced give rise to any liberation of heat. It is well known that the temperature of mines situated in granite, where kaolinisation is constantly going on, is lower than that of those worked in clay-slate, while high temperatures of thermal springs are not more frequently observed in masses of kaolinised granite than elsewhere.

The mines on the Comstock lode are situated in a highly-volcanic region of very late tertiary age, and in the almost immediate vicinity of lava-flows and boiling springs. Until, therefore, stronger evidence than that yet furnished shall have been brought forward, it is probable that the majority of geologists may continue to ascribe these phenomena to the action of volcanic agencies.

Fopstone-road, Kensington, Aug. 9. J. Arthur Phillips.

DON PEDRO GOLD MINE.

Sir,—As we shareholders of the Don Pedro Mine have heard nothing of this profitless and expensive concern the last two months, I do not see the use of continuing two expensive places—one in London, the other abroad—and having all the charges to pay. I should be glad to see a meeting called of the shareholders, and the following proposal made—a reduction of salary of the directors and secretary in London, and the heads of departments abroad—say, to one-half their present pay until the mine is made self-paying. Were some such measure adopted we should soon see the worth or the worthlessness of the mine. If worthless the sooner the concern is wound-up the better. The reports received of late years I think ought to be studied by the shareholders as models of the art of doing nothing.

——— A Shareholder.

RICHMOND MINE.

Sir,—The following tabular statement shows the comparative yield in dividends to the shareholders of the six mines on the Pacific Coast of North America in 1879:—

	Yield.	Dividends.	Percentage.
1.—Eureka Consolidated ...	£548,680	£165,002	30
2.—California ...	515,395	324,000	51
3.—Consolidated Virginia ...	496,272	270,000	54
4.—Ontario ...	265,097	120,000	45
5.—Standard Consolidated.	242,091	120,000	50
6.—Richmond Consolidated	310,800	67,500	22

Aug. 18. ——— R. M. Brereton.

EXPLORATORY WORK—TUNNEL DRIVING.

Sir,—Mining generally is very slow work, and many will, perhaps add expensive. But not unfrequently the expense incurred to start machine drills would compensate the proprietary of mining adventure manyfold, especially where the exploratory work requires heavy pumping appliances and cost. "Our bottom drifts, six men each, have been advanced 6 ft. during the week, at 160s. per fathom," is not an unfrequent report; and the agents may not unfrequently add, "we are glad to report such good progress," without considering the auxiliary costs for a moment. It is well known machine drills do not meet every requirement, and, perhaps, at times disappointment is felt that a piece of ground after being tunnelled through has proved anything but what was expected. Rapid advance, however, is the usual requirement sought, and having culled from time to time a few paragraphs from the columns of the *Mining Journal* on machine drills, their reappearance collectively may not be out of place.

Carn Brea Mine: Twelve months working, about nine months in actual drilling; driven 191½ fms., or for—

12 months an average of 16 fms. per month.
9 months actual work an average of 21 fms. per month.

Sutro Tunnel, Nevada, took nearly 8¾ years in driving to reach the Savage Mine. Length, 20,170 ft.; progress slow at first, hand-power; afterwards six machine drills employed—

Least progress, hand-power, 19 ft. per month.
Greatest machines, 417 „
Average „ 300 „

Gradient, 3 in. per 100 ft.; cost of tunnel, 800,000*l.*

Dolcoath Mine, 314 fm. level: Ground driven in four weeks 8 fms. 4 ft. 8 in.; cost of driving, exclusive of air, 12*l.* 16s. per fathom. The price for driving this level by hand-power was 26*l.* per fathom, but at this price the men did not earn 50s. per week.

Halkyn Mines: A deep adit level, to be 12 miles long. Machine drills made advance of 150 fms. in six months; in one month 31½ fms. were driven; adit 8 ft. square.

West Tolgus Mine report: The boring machine is of great advantage to us, as by it we can sink fully one-half more ground at a much less cost per fathom. The average rate of sinking by hand labour was 5 ft. per month, and cost 103*l.* per fathom. The average rate of sinking with boring machines was 8 ft. per month, and cost 67*l.* 10s. per fathom.

The St. Gothard Tunnel: The official report for August, 1878, says, for Italian end of tunnel the heading was advanced 94 fms. 2 ft. during the month.

The Eberhardt and Aurora Company: Driving tunnel 7 ft. by 9 ft. principally through hard limestone mixed with quartz at the average rate of 45 ft. per week; the tunnel at that date being 3841 ft. from its mouth, and was then being driven at the rate of 95 ft. per week.

Isabelle Mine, California: Fair progress seems to be the rule at the tunnel; the reported distance driven is about 3100 ft., equal to three-fifths of a mile. It seems only a few months ago when they began operations. But 252 ft. advance, and 284 ft. advance, cannot be considered bad monthly driving, with 83 ft. as the maximum of their weekly advance.

The above data are doubtless above average mining results, and many are quite satisfied with results much below them; still it shows what can be done where system and application are employed.

London, Aug. 19. ——— C. R.

COST-BOOK MINING, AND LIMITED LIABILITY.

Sir,—Why does the Cornish Cost-book Mining System still survive? It is a system only suited to the infancy of English mining, and that when the shares are all in local hands. And, above all, it supposes, what is not always the fact, that the local management is perfectly thorough. The real answer is that most, if not all, of the best cost-book mines are virtually in the hands of local bankers. It is their interest that this obsolete system should be kept alive, for it is one great and steady source of their profits. If the best cost-book mines were transformed into limited liability companies with a good margin of uncalled capital (as was done some years ago so successfully with Devon Great Consols) we should find copper and tin shares in good undertakings far more sought by respectable and solid investors. If South Caradon and Wheal Crebor as leading copper mines, East Pool and Wheal Peevor as leading tin mines, and all of them dividend paying, were so transformed, the surest means would be taken to attract capital to develope Cornish metal industries. These are the pick of cost-book mines, but others such as Dolcoath, Carn Brea, South Wheal Frances, and South Condurrow will readily suggest themselves, in which a very large amount of capital has been called up, and some of which depend in a degree upon bankers' help. In real truth the cost-book system is very often only a snare and a delusion, and so has come to be regarded with a just horror by very many.

It has never spread beyond Cornwall and Devon, and it only lingers in those counties because it is fostered by local banking and other interests. The system is one which involves every shareholder in absolutely unlimited liability, and this liability still remains for two years after a transfer of shares! This fact men seldom realise, and often do not really know till they learn it by the bitter experience of the Stannaries Court. The system is so worked that it helps to lull men into a state of false security, by a sort of quarterly account of profit and loss. How common for these accounts to be imperfect. I suspect now that some mines declare dividends when they really should make calls, but they are bolstered by advances from the banks. See how the accounts are audited. Instead of having them thoroughly examined by independent and impartial auditors they are often merely looked over by interested parties. Owing to the strength of purely local interests the management is usually a local one, and well removed from the healthy stimulating influence of publicity with a London office and London meetings. The mode in which the capital is divided is in itself misleading, and renders a comparison with limited companies difficult. For not merely is the liability absolutely unlimited, but the shares are often few in number. People when they see this are apt to forget the very large large sums which have been paid per share, which not unfrequently make the total capital of cost-book mines much greater than of limited liability mines. And in the case of cost-book mines this capital is always capable of an indefinite increase. The small number of shares, too, seriously misleads people in their estimate of dividends. About 12,000 is, I think, the largest number of shares in a cost-book mine, while most of the best have only some 6000 shares or less. One indeed, has only 512 shares. People are misled in this way. The dividend is declared at the rate of so much per share, which looks very fine, but the total amount divided is often almost insignificant. Compare the dividends of the best cost-book and limited liability mines. Were this wretched system really good it would long ago have obtained outside Cornwall and Devon, but where is there outside those counties one single prosperous cost-book mine, whether lead, tin, or copper?

Unlimited liability in the case of our great banks is now being given up, and we hear on all hands how good is the change to limited liability with a good uncalled margin. The change has induced men to invest in banks who would not have dreamed of so doing in their wildest moments so long as they had to face unlimited liability. And yet these solid holders are the very people needed not less to develope mines than banks If men would only be wise in time and avoid the shares of cost-book mines as they would the plague, I am quite certain the metal mining interest of this country would gain greatly. Instead of men of straw who speculate for the rise we should have solid investors, and instead of local management, of which but little is really known, we should have the publicity which attends on London management and London meetings. The present is a capital time for changing the constitution of some of our cost-book mines, and for sweeping into the past what is really an obsolete system, which only lingers on because it is propped up by local interests which feed upon it, and because it affords a means for the most reckless speculation. Men forget that this speculation is a very great source of injury to honest mining. ——— Mining Investor.

GOLD IN WALES.

Sir,—I have read with pleasure the historical letter of your valued correspondent Mr. Readwin on "Gold in Wales," especially the Bohemian custom mentioned—the cutting up of a bullock's skin into strips, tying them together with one end of the length to a stake in the ground, making a circuit with the other, and thus making the enclosed ground the mining sett. During the time I was prosecuting mining pursuits in the Malay Archipelago, a number of semi-Siamese and Malaymen, driven out of their country by a rival Prince, came to me soliciting to be employed to seek for gold and tin. These natives having under my direction found in the mountain ravines quantities of tin, I was petitioned by the "Head Men" to permit of a custom of prayer they believed insured the continuance of the ore in quantities, and a protection from the Evil One. I need not remark that although adverse to such superstition, yet desirous of establishing a good feeling between us, I granted their request. Now, the difficult part was the procuring of the buffalo. These animals are uncommon in the country, therefore great expense and much difficulty had to be surmounted before the animal of a certain age and length of horn could be procured. All minor preparations being ready, the order was given to stop and to attend dressed in festive costumes for three days. The buffalo being procured and gaily dressed was driven on the selected ground, when after prayers were offered the buffalo was slaughtered and the blood conducted into a hole in the ground by means of the skin, and the latter allowed to remain half in the ground until it rotted. This ceremony greatly pleased the natives, who worked with great willingness, often enduring fatigue, accidents, and disappointments, having unbounded faith in the great buffalo blood. Is this history repeating itself? Mass.

MINING IN LLANARMON.

Sir,—Bryn-y-Mwyn: This property, like its predecessors, is also a youngster of about four years old, but perhaps for the reason that it has learnt to walk, and to return some of the favours bestowed upon it, it appears more attractive to those who undertook to develope and cultivate the mine of wealth that appeared conspicuously prominent in every lineament of its rough exterior. At any rate it makes its *debut* before the public as an interesting specimen of successful mining. It is situated east of Lady Ann and Nant, and west of Pant-y-Gwlanod. The principal lodes are the Pant-y-Gwlanod middle lode, new lode, and south lode. On the Pant-y-Gwlanod a shaft has been sunk 30 fathoms, and from this depth a level has been driven for some distance on a promising masterly, but withal unproductive, lode. Allowing for the contraction that must have occurred, this level was driven remarkably small, as at present it is with the utmost difficulty a medium-sized person can crawl through it. A little higher up than at this point the present party put out a cross-cut, and in a few yards cut the true hanging-wall of the lode upon which there lay a rib of ore varying from 4 in. to 6 in. wide. This ore has been followed for some distance, and it continues to improve as the ground is opened cut. It is not improbable but that this run of ore is the same as noticed by the undersigned as coming in at the bottom of Gigfrain shaft. If so, the prospective is most encouraging. There are many evidences that can be adduced in favour of this opinion. It would not be an exceptional case where the old men had worked one part of the lode while the ore was deposited on the other, but such accidents were common to them, for the obvious reason that they seldom put out cross-cuts. On the middle lode hardly any trial has been made. On the new lode there is a very attractive sight. It appears strange how this also was missed, when from the outcrop of the lode 50 tons were raised in about a month by the old gentlemen. Here, instead of sinking on the lode, they followed a string, or flyer, from the lode. Suspecting this, the present party put out a cross-cut from the bottom of their workings, and after driving a few yards were rewarded by cutting a rich lode, 4 ft. wide, arranged as follows:—On the footwall a rib of solid ore, varying from 6 in. to 7 in. wide, overlaid by a small bed of flookan, then follow 4 ft. of fine crystallised carbonate of lime, 4 in. of galena, all mixed at times with a clay. On the south lode some hundreds of tons have been raised, but it has not been tried under the 30 fm. level, having a southerly dip; while the Pant-y-Gwlanod lode is northerly one. It is evident that in another 10 fms. these lodes will form a junction. What the result will be of the junction of two powerful productive lodes here remains to be seen.

Pant-y-Gwlanod was last worked in the year 1849. It was a contemporary of the Nant. It suffered, if the term is allowed, and was abandoned consequent to the same cause. But it would have been impossible for this mine to have held out much longer in the manner it was being worked. The engine-shaft was 20 fms. shallower than the principal workings. It was worked with a multiplicity of chains and rods, which were continually breaking. The western part of the mine is mostly virgin ground, in which there have been left splendid pitches. The miners offered to take this mine off the company's hands upon most reasonable terms, as can be seen by the following from parties who stand high in the neighbourhood. J. A. Eng.

Dear Sir,—I worked at the Pant-y-Gwlanod Mine about 30 years back. I was working then 10 yards east of Gigfrain shaft. We were cutting down the ore on a down-hill, 6 yards deeper than the shaft. There were 16 men in the sett. We could raise from 10 to 15 tons per month. When the mine stopped we had to lift down the trench and a crammock drawing the water to the shaft. The men worked the mine very badly. There was something breaking every day, and the water was continually getting into our place, so that we could only work about half time. They should have sunk the shaft deeper, and driven a level under the place. In the whole mine they were raising from 40 to 50 tons a month. When the mine stopped the miners offered to work it themselves, if the company would allow the engine to remain. My brother, Thomas Williams, had made arrangements with the collieries, whereby he would be responsible for the whole of the coals consumed. The price of lead was then about 7*l.* per ton. The miners were fully aware that if the mine was worked properly it would pay them exceedingly well. I have not the least doubt of this myself. I have often asserted that this is not a speculative but a sound lucrative business if conducted in a practical and judicious manner. Robert Williams, Pant-y-Gwlanod.

Dear Sir,—When this mine was working I was engaged with eight men driving west on a strong course of ore, which we left. In the 140 yard level the run was proved, and from where we were there were 60 yards of stopes. I believe this to be the richest old mine I know of, and believe whoever will work it will be handsomely rewarded. David Harrison, Cross Keys, Llanarmon.

Dear Sir,—I worked at Pant-y-Gwlanod until it stopped, and during the time I was employed I worked upon a course of ore, 6 ft. wide, in the 160 yard level. I have seen lumps of ore over a ton in weight. I worked in the 130 yard level, and left ribs of lead about 18 in. wide. I was one of the party that offered to take the mine on tribute. We offered to pay 100*l.* for the machinery, and pay the wages of a captain. They were coming to the western runs at Gigfrain shaft. I am certain, when opened out, this will prove one of the best mines in Wales. John Jones, Plynonenwell, Llanarmon.

Dear Sir,—I was one of the last that worked on the bottom of the mine. We sunk 3 ft. under the mouthpiece of the bottom lift. We were taking the ore

with buckets. There was a solid rib of ore on the bottom, 1 ft. wide, and inches in different parts elsewhere. We were undoubtedly coming into the western runs. The western part of this is whole, with the ore, after the recent discovery at Bryn-y-Mwyn, seen at both ends. GEORGE JONES, Bryngloch.

SHROPSHIRE MINING.

SIR,—As the Salop and North Wales Correspondent in your last week's Journal seems to think that it is useless tampering in a mine where there is one lode in operation to seek or expect another of other nature or material—he (your Correspondent) says it is not geologically or meteorologically wise to do so. I quite concur in his remarks should the one be coal and the other lead ore; but as barytes analogous to lead ore we differ in opinion on this subject; perhaps the Salop and North Wales Correspondent has paid but little or no attention to the various mines in the Shropshire district, otherwise he would ascertain the truth of my statement; for instance, there is the best mine in the locality (Snailbeach), which has been worked for awards of 100 years for lead ore, that mine is now yielding some 100 to 150 tons of barytes per month. This barytes lode is the mother lode of that great and valuable mine, and has carried its course for 2 fms. or so deep, when the richer metal turned its poor neighbour on one side till within these few years. A good deal has been said and written upon the different lodes in the district. Many scientific men, calling themselves geologists, have gone so far as to say that no lead ore will be found on the north-western range of hills so far away from the Stipenstones range; this has been proved to satisfaction of anyone interested in the matter, and I can do no better than refer the Salop and North Wales Correspondent to Professor Deane's writings upon it, where he says that the Corn hills will be found the best hills in the locality, and I hear from a friend that the Cliff Mine Mining Company are taking the same views and seeking for lead ore in the very midst of a large body of barytes hills; this, should the present company be successful in finding, will bear me out in writing upon the Wotherton Barytes Mine, and prove that whether geologically or mineralogically it will be a great beon to the community and a prosperous result to the proprietors of the two mines.

Salop, Aug. 9. OBSERVER.

MINING IN SHROPSHIRE—THE WOTHERTON MINE.

SIR,—I was surprised on seeing the remarks made by your Salop and North Wales Correspondent in last week's Journal respecting the opinion expressed by "Observer" in your issue of the previous week concerning the Wotherton Mine. The remarks of your Correspondent are more likely to injure than do good—although we do fear so far as the produce of sulphate of barytes is concerned, we have at this time an immense deposit of the finest barytes at the Wotherton Mine, which can be seen at the bottom, 50 fms. from surface, where the lode is more than 20 ft. wide, of splendid barytes. From this lode more than 100,000 tons of barytes have been sold by the late Mr. Magennis and the present company. I can tell your Correspondent that some of the best mines in this county have produced sulphate of barytes from the backs of the lodes (Snailbeach one is doing this at present). The late A. Dean, F.R.S., &c., said to me, when I showed him some of the barytes from Wotherton, I have no doubt you will find a larger deposit of lead in connection with the barytes in such a lode as you have, for it is just like the large quantity of gossan in the backs of rich copper lodes—Devon Great Consols, to wit." We have some very good specimens of lead from the eastern end at the bottom, such as we did not get in the levels above. I do not think your correspondent has been underground in Wotherton, but if he wishes to see the mine, and will give me a day or two's notice, I will take him from Minsterly (free of cost) to see the mine.

JAMES YELLAND.

Pontesbury, near Shrewsbury, Aug. 19.

MINING IN SHROPSHIRE—THE WOTHERTON MINE.

SIR,—I notice what your Salop and North Wales Correspondent says in last week's Journal with regard to lead being found at Wotherton, which he terms saddling a good mine with a mineral that was never intended to be found there. Now, I should like to ask him one or two questions relative to this matter. Firsly, to state in and every condition, geologically and mineralogically, under which lead ore is found. We can then read over the catalogue, and see whether Wotherton under its present conditions is excluded. Secondly, what he knows personally about the mine, for to the best of my knowledge he has never been near the place, and how anyone can give an opinion, geologically or mineralogically, about any mine, and above all put it in print, without having seen it, is in my opinion most wonderful.

It is a well known fact that sulphate of barytes has composed the back of most of the best lead lodes in Shropshire—to wit, Snailbeach, Tankerville, Rock House, and Round Hill. And after all this evidence one would natually expect something in the shape of lead ore under such a barytes lode as that of Wotherton, more especially after seeing the nice specimens of lead ore we have already taken out of it, and the good indications we have for the future. Being all my lifetime connected with mining I have noticed the different opinions that have been uttered with regard to a good many mines, and how generally turns out that where certain wiseacres (wise in their own conceit) have given bad opinions the best results have ensued. What little I know of geology I am certain that no one is able to sit down in his office and write geological and mineralogical opinions without ever having become personally acquainted with the locality he writes about. Such opinions are at best worthless, but often hurtful.

Wotherton Mine, near Cherbury, Salop, Aug. 19. BARYTES.

CARDIGANSHIRE MINES.

SIR,—The Tan-yr-Allt Mine was first discovered by some old and shallow workings on a north and south lode, which proved very rich, and the old miners worked underhand until stopped by water, the level having been dressed by hand. More recently a deep cross-cut was driven to the lode, and some lead stoped from the back of it, but it was not very productive at this point; a shaft was then sunk to the 12 fm. level, and very rich steel ore cut, but only lasting for about 2 fms. above the 12; recently, however, this level has been continued north, and lead worth 2 tons to a fathom is now being driven on.

A shaft was sunk to a 22 fm. level, and in driving north from it a splendid course of ore was discovered, which lasted up to the end, and from a stope about 11 fms. long and 11 fms. high above the level—say 121 cubic fathoms—upwards of 130 tons of lead were sold. The course of ore is going down in the bottom of the 22, and is worth from 1½ to 2 tons to a fathom. The ore-ground in this mine is a good way to the north of the engine-shaft, consequently to work it advantageously a new shaft ought to be brought down from the surface; this should be commenced close to the dressing-floors, and would pass through the rich ore now in the 12, and cut the course of ore going down in the sole of the 22. This north and south lode is intersected with several east and west lodes, and at these junctions the former lode is invariably productive. No trials have been made in the east and west lodes, away from the influence of the north and south lode, but I firmly believe if this were done to the east before the north and south lode has intersected them they would be found rich. This is a very compact and promising mine. To the north of it we come to the Ynys Mine, the most westernly of this district, whose sett, which is a very large one, extending almost to the sea. The workings, though shallow, cover a great area, and have proved in a great many places very rich for ore. There are no less than 12 known lodes on this property, some east and west, some north and south, and some caunters, thus making the mine a very puzzling one to work. Some of the lodes have produced very rich silver-lead, and others galenga ore of great purity.

Recently the attention of the proprietors has been directed to the west, where the lodes are more settled, and an old shaft having been discovered which was flooded and filled with silt by an inundation of the sea about 70 years ago, a rich course of galena ore mixed with blende was found in the bottom; this may fairly be classed as a very rich discovery, for the lode is 12 ft. wide, composed of 15 to 20 in. of pure solid galena, about the same width of blende and lead stone, and the remainder of the lode a fair mixture throughout. This mine is destined to prove one of the prizes of the future, as following this lode along we find it intersected with several feeders running into it. The water is moderate, and perhaps it would be as well to explain that a railway and other embankments effectually preclude any future inundations. This mine has ample water-power, and being situated within a mile and a half of the railway station and shipping place of Ynyslas can be more cheaply worked than any other mine in the county. It is believed to be one of the mines worked by the Romans, from the fact of the remains of one of their incampments being close to the workings, the deepest point, however, is only 30 fms. below adit. In more recent times it was worked by Sir Hugh Middleton. There can be no doubt that if the new discovery were developed in depth large returns of ore could be obtained, and this mine can be more economically worked than any other in Cardiganshire. The mine is private property.

Adjoining this to the east is the Dolclettwr Mine, which has been sunk to a depth of 60 fathoms below sea level. A local company has been started to work this mine. There is a very fine course of copper in the Llainhir part of the mine, and there is a fine plant of machinery on the property. Further west again is the Brynarian Mine, once very rich for silver-lead ore. This mine ought to be worked by bringing up the deep level from Dolclettwr Mine, which is already close to the boundary, and another 40 fathoms would cut the Brinarian lode at a depth of 15 fathoms under all the deep workings at Brinarian, and open up a splendid property. CHARLES WILLIAMS.

Dole, Taliesin, R.S.O., August 19.

THE CONTINUATION OF RICH MINES IN CARDIGANSHIRE.

SIR,—Some three weeks since there appeared a letter in the Supplement of the *Mining Journal* in which my name as well as others appeared, and in which the writer seemed to think that no two mines in Cardiganshire on the same vein, and adjoining each other, had been worked successfully, and, therefore, deprecated any such trials from being made, as they, in accordance with his enlightened views, must prove a failure. It so happens from the room in which I am now writing this I see before me the old Goginan, the mine adjoining it, the Bwlch United, and the Cae Nant and Pen Craig Du Mines joining the Bwlch United, all of which have proved very rich and productive to the depth yet explored. I might if I chose give a cluster of mines one, two, three, four, five, and six, all adjoining each other, which have all proved very rich and productive. Again, if we take the Frongoch Mine, the richest mine yet worked in the county, to the west we have the Wemyss Mine which joins it, and so far as it has been worked has proved to be rich, and there can be no two opinions in the minds of practical miners that this is likely to prove the richer of the two, and returns and profits must be made as soon as dressing machinery is erected.

I would call attention to the first-named lot of mines as to the west of Goginan, which for an outlay of 500*l.* in seven years gave 70,000*l.* profit. Very little has been done on the Goginan lode. I mean the lode that produced at Goginan more than a million pound sterling of lead and silver, and several hundreds of thousands of pounds worth in the mines mentioned east of it. The little that has been done has exposed its back about half-a-mile west of Goginan grant for a distance of about 150 fathoms, containing rich silver-lead, quartz, and gossan; a much finer lode than where seen in the Goginan grant. Strange to say that this lode stands whole through the West Goginan grant, where an outlay similar to that made at Old Goginan of 500*l.* would in all probability produce equally good results as it did in Goginan, and would realise a moderate little fortune to any half-dozen gentlemen laying out the trifling sum named. The lease may be had on good terms, and the machinery purchased at about a quarter of its cost and erection. As to maps of mines, as far as I am concerned they do not pay; I have hundreds by me, giving the situation, depths, and returns of all mines in the county offered at 2s. each lying on hand, and likely to do so for a long time to come, as far as I am enabled to judge of the matter.

Goginan, Aberystwith, Aug. 18. ABSALOM FRANCIS.

LISKEARD DISTRICT—WEST MARY ANN.

SIR,—A prominence has been given to this locality by the flood of printed matter posted to all parts respecting the wealth in silver-lead of Wheal Honey and Trelawny. Allow me to direct the attention of any of your readers who have not already done so to a mine on the same line of ground—West Mary Ann. The shares are only 3000; the monthly costs about 70*l.*, and the property mostly locally held. They have made no fuss; are little heard of I fancy out of the district, but are none the less well worth looking after for a prospective early success, and may be second to none. It adjoins Mary Ann, and this adjoins Trelawny. The country, as far as the mines worked this century, is proved to be a valuable one for making a highly successful mine.—*Aug.* 17. LEAD ORE.

Last Report.—Since the last general meeting our attention has been confined to the sinking of the engine-shaft on the underlie. In going down we have carried the lode with us, and have sunk about 10 fms., making the depth below adit just 20 fms. vertical. The first 6 fms. of sinking was through good orey ground, the lode being on an average 1 ft. wide. In continuing our operations below this point we were interrupted by a floor of hard elvan, which came in from the hanging-wall east. Our lode became disordered for a fathom or two, but I am pleased to say we have got through it, and are now into a soft bed of mineralised killas, which is most congenial for the production of lead, and which has considerably improved the appearance of the lode. The little steam-engine we have is working well, being quite equal for the present for drawing the water and for hauling purposes. This enables us to carry on the work more expeditiously than before. We are sinking the shaft with all vigour for a few fathoms more before commencing to drive, and, judging from present appearances, have full confidence we shall meet with good results.

MINING IN GWENNAP.

SIR,—At East Wheal Buller they are cross-cutting through a most beautiful elvan. This elvan can be traced, as it accompanies the lodes, running nearly parallel with them all the distance from Gwennap United Mines to Wheal Buller. One of the Buller lodes is expected to be south of and very near this elvan, and it must consequently soon be opened on in East Buller. The lodes already opened in this mine show the same splendid gossan so often alluded to as never failing to be followed by large courses of copper ore. This district has been very abundantly prolific in copper ore, and here is a long piece of virgin ground right in the centre of the great Gwennap district, traversed by cross-courses, elvans, and great gossan lodes, which must contain large deposits of copper ready to be unearthed by some one, and Capt. Tregay says that he is going to do it. He has opened up plenty of tin and copper too in his day, and I believe that he will again be succesful here.

West Poldice is to be pushed on now, and I believe that it is generally agreed there is a good mine here already discovered, only awaiting the wheels to be set agoing to give good profits, and Capt. Teague is the man to do it.

The Penstruthals and Comford all are concerns which seem destined to go ahead; and although Capt. John Mayne has a quiet little corner down at Trevince, more noise will have to be made about that before long, for I have seen lately broken from there as pretty stones of gossan, mundic, and copper ore as you will see in a long day's march. Looking at the position one is constrained to cry out, Well, if it is not there it ought to be. A GWENNAP MINER.

PHŒNIX AND WEST PHŒNIX UNITED MINES.

SIR,—The statement of accounts and report submitted to the adventurers for the past four months in the above mine is, to say the least, very unsatisfactory. I was recommended to buy some shares when they were at 5½, and I was informed at the same time that the mine was making from 1000*l.* to 1200*l.* clear profit per month. This latter statement was to some extent subsequently confirmed by the statement of accounts issued in March, showing a gain for the four months—though the costs were then, as now, charged three months in arrear—of 3500*l.* Instead of improving on this figure, with the improved and steady price of the metal the mine is producing, the close of the next four months shows an utter collapse, resulting in a grand total gain of about 220*l.* Not only do the sales of tin realise 1920*l.* less than the previous four months, but the pursers or agents, or both, have managed to increase the cost by 1030*l.*, for which no satisfactory reason is given. I feel convinced that Phœnix Mine can at the present time, if properly managed, pay easily 6s. or 7s. per share four-monthly. But if it is intended that the mine is not to pay dividends, then I ask the managers for whose benefit are the workings carried on—not for the shareholders, I should imagine? I should also like to ask the managers, through your medium, why they do not allow their meetings to be reported fully in the *Mining Journal*. If I had known that the report and accounts were going to turn out so unsatisfactory I should certainly have made it convenient to have been present at the meeting; but, on the contrary, I quite expected a 6s. dividend. No wonder that one hears of a large number of shares being pushed for sale by an individual who is said to be related to one of the pursers. A DISAPPOINTED HOLDER.

Aug. 13.

THE ST. AGNES AND GWENNAP DISTRICTS.

SIR,—I notice with interest the remarks which from time to time appear in the Journal on various mines, and in all fairness I know of nothing more judicious than the bringing forward of those districts to prominence which have done so well for capitalists. The Camborne and Illogan districts are of world-wide notoriety, but the St. Agnes and Gwennap districts are not so well known, simply because at this moment they are not producing so much mineral. Capitalists will, however, do well not to lose sight of these mineral fields, for, if rumour foreshadows anything, more will be heard of them ere long. Their past history has been wonderful, and it is evidently within the range of probability that their future history may be more remarkable still. DISINTERESTED.

THE MINES IN BREAGE, &c.

SIR,—I went from Marazion to Breage yesterday, and incidentally made enquiries into the condition of mining in that parish, and more particularly as to whether there were any fresh workings, or proposed workings. I found that West Vor (contiguous to Great Wheal Vor) is worked on a very limited scale above the adit level for tin. The boundary between the granite and clay-slate is in the sett, and the prospects are fair for production. The lode is that which yielded all the profits (272,000*l.*) in Wheal Vor. It cannot, however, be reasonably expected that much good will accrue to the shareholders before deeper works are effected, which will require a steam-engine. Polrose is in full operation, and success is said to be probable. It is well managed by Capt. Bennetts.

Some work is about to be devoted to a portion of Great Wheal Fortune sett, which has been divided, this portion being called New Wheal Fortune.

When the times were very distressing to the miners in the district a year or two ago Mr. Argall, of Breage village, in order to give them employment, took, under the late Mr. J. Jope Rogers, the sett of a quarry of blue elvan, well qualified for metalling roads, the dues being fixed at 1d. per ton. The working has been continued till just now. Owing to the decease of Mr. Rogers the land (called Rosemebar) has been sold, and the purchaser will not continue the licence under 6d. per ton, so the work has ceased. At one time Mr. Argall had 40 men employed in the quarry and on his farm—merely to aid the poor men in their distress.

Great Work, the property of Capt. Teague, is about to be unwatered, if I am correctly informed, which is good news for the miners in the neighbourhood, which are, however, now not very numerous. The pumping engine, &c., is *in situ* at Penhale, but idle. The gentleman who worked that mine had a wonderful store of patience to have persevered so long under continual losses.

The only building standing on Wheal Vor is the stamping mill-house, near the road from Helston to Herland Cross, and the only piece of machinery on the sett is a decaying water-wheel. This is one of the mines which should never be resumed; but it is not improbable that at some future time some foolish man will take it up and form a company for re-opening it. The loss in this mine—last working—was 350,000*l.*, including 100,000*l.* profited in Wheal Metal, part of the sett, which Wheal Vor absorbed. Godolphin is another mine which should be left idle for ever. The loss last working was 150,000*l.* It is rumoured that South Wheal Fortune, a copper mine in Breage, is about to be re-worked, and it is well deserving of it, because it was not stopped on account of poverty, but because the engine was a miserably bad ene. It has been idle about 25 years. The late Capt. Michael Martyn was the manager. New Hendra is said to be deserving of further development, and is likely to receive attention.

There are many places in Breage well worthy of the attention of miners. Except in Wheal Vor, Great Work, Penhale, and Godolphin, no part of the parish has been extensively developed. Polladras Downs would pay well at the present price of tin. There are eight or nine known lodes here. The outfit would cost about 8000*l.* Mrs. Popham is the landowner.

In passing through Crowan I was informed that there is not a miner at work in the parish. Formerly thousands of persons were employed in Crenver and Wheal Abraham, Binner Downs, Wheal Treasury, West Treasury, Wheal Strawberry, and other mines, some of which (excluding Crenver and Wheal Abraham), would pay for a re-trial; in particular Wheal Treasury and Polcrebo. On Polcrebo there is a steam-engine in good condition, and I understood a short time ago that operations would be commenced forthwith; such has not been the case, as I found in passing along the road to Camborne to-day.

The projected railway from Gwinear-road to Helston—for which an Act of Parliament has been obtained—would be a great boon to the district through which it is to pass, and to Helston and the Lizard peninsula. Whether the requisite capital can be raised remains a question. I am inclined to think that the Great Western Railway Company will construct the line rather than let it slip through. It would be for their interest to ensure its construction.

On my way to Breage I called at Wheal Jewell, near Marazion, a little mine of peculiar promise. I intend to send to you, a few days hence, some very interesting facts in relation to this mine and the district in which it is situate. R. SYMONS.

Truro, Aug. 17.

[For remainder of Original Correspondence see this day's Journal.]

COAL-PIT REFUSE.—Every one who has passed through a coal-mining district will have remarked the enormous accumulations of rubbish surrounding the mouth of each pit. The dust mounds of the estimable Mr. Boffin would be pigmies by the side of these gigantic heaps of "matter in the wrong place." Until lately science shook its head mournfully at the piles; rubbish they were, and rubbish they would remain. At last, however, the discovery was made that the shale, one of the ingredients, could be made to yield a large quantity of petroleum by a process of distillation, and although the industry has not made, we believe, much progress, shale is now recognised to have a certain value if a small one. There still remained, however, the bulk of the deposits to be dealt with, consisting in the main of the hard clay—it seems half petrified—which comes up from the pits with the black diamonds. Human ingenuity accordingly next turned its attention to this refuse, and already something of a victory has been achieved over the stubborn substance. It seems to have suddenly occurred to someone who was enquiring into the subject that bricks are made of clay; why, then, should not this clay be converted into bricks? The thought struck him as so happy that he communicated it to the mining experts of the locality. Of course, they ridiculed the idea as visionary; that is the general way with experts when new notions are placed before them. Fortunately the proprietors of a colliery that was greatly embarrassed with clay accumulations thought the idea might possibly have something in it. They accordingly had some experimental machinery made for disintegrating, pulverising, kneading, and shaping the refuse, and in due course of time their courage was rewarded with a supply of excellent bricks, far superior in quality to those ordinarily sold in the market, and much lower in price. At present the machine manufactures a dozen and a half of bricks per minute; but there is, of course, no practical limit to the productive power of a big colliery, as the owners might set up as many machines as they thought fit. At the more extensive workings large quantities of bricks are required annually for repairs, new buildings, and lining the shafts, and this invention thus brings consumption and production into the closest alliance.

But no difficulty would be found, apparently, in disposing of any surplus, as the bricks have already achieved such a reputation for themselves as insures a ready sale. We trust the discovery will in some slight measures compensate coalowners for the exceptionably low price to which competition has forced down the commodity in which they deal.—*Globe.*

Pig-Iron in America.—America has facilities for producing 4,000,000 tons per annum of pig-iron by existing blast-furnaces. At New York and Philadelphia there are at present total stocks of upwards of 700,000 tons of imported iron and rails.

REPORT FROM CORNWALL.

Aug. 19.—There is again very little that calls for comment. The usual amount of uncertainty prevails, and there is in consequence the usual absence of speculation or activity. A good many of our tin mines can do very fairly at present prices, and there would be very little difficulty in considerably increasing their numbers. For copper and lead the outlook is hardly so favourable, but here, too, a slight improvement would mean a great deal. Without pretending to speak too positively as to time, we feel pretty confident that a great revival in the way of mining extension is not far distant—so many promising localities are now obtaining attention, and so much in the way of encouragement is meeting the efforts already made. There are at least half a dozen different points in Cornwall and Devon from which, judging from what we have observed, news of important discoveries may be expected ere long. There are as good mines yet to be found in the West as ever have been known, and as in old times they are not unlikely to come well together. As a rule, very little attention is paid to a certain portion of the mineral wealth of Cornwall and Devon, which is yet very important, and the development of which is almost in its infancy. We do not of course allude to the metalliferous minerals, deficient as their development in certain localities may be, nor to the china clays, though some of the commoner clays of the West still await thorough utilisation. Our reference is to the building and ornamental stones of the two counties, which abound in almost every direction, and yet of which, with one or two exceptions, the chief use is but local. The best known of these are the granites and the slates, yet to how small an extent are either of these worked compared with their abundance, and what is done in them is almost wholly done in Cornwall, though Devon contains many a point at which as good slate as that of Delabole could be raised in quantity, and Dartmoor has not a few granite quarries which in produce would compete with that of almost any locality in the sister county. Probably an impetus will be given to the Dartmoor granite trade by the now certain completion of the Prince Town Railway, based partly upon an old horse-tramroad, which has long ceased to be of any practical utility.

It is a very unwelcome spectacle, both in Dartmoor and sundry other localities, to see promising quarries deserted, and such granite as is being raised in the neighbourhood being wrought from surface blocks, when beneath the turf are inexhaustible treasures, Happily Cornwall can make a somewhat better show. De Lank has plenty of work on hand in providing for the Eddystone Lighthouse, and Messrs. Freeman cover what is literally an enormous area with their respective works, and could supply almost any demand. To show what the capabilities of our Cornish granite quarries are we may just mention that this firm the other day lifted from its bed at one of their quarries, in the parish of Mabe, a block 50 ft. long, 20 ft. wide, and 15 ft. deep, thus containing about 15,000 cubic feet, and weighing 1250 tons. It is of excellent quality, and was lifted by a blast of 65 lbs. of Kennal Vale powder. It is a pity there is not more demand for this material just now, for the slackness of trade has caused a number of granite dressers to emigrate to the Cape, and by-and-bye they will be wanted in vain.

In ornamental stones all efforts to bring the beautiful Lizard serpentine into extensive use have hitherto failed; but the Devonshire marbles, and chiefly those of Plymouth, have come of late into somewhat extensive demand. The most important work ever executed in these marbles is now being carried out by Messrs. Goad, of Plymouth, a series of polished columns and pilasters for the Brompton Oratory, which will, even with their extensive resources and command of blocks of any size, take three years to execute. The columns are about 20 ft. high in the shaft, and 2 ft. 6 in. through, in blocks ranging up to 9 or 10 ft. long, and the shafts of the pilasters are 20 feet, with a total polished area (including base, &c.) from the floor of about 80 ft. Torquay is very rich in marbles, but not so rich as the Plymouth district, which ranges in colour of stone from dead black through red, yellow, rose, dove, and brown—mottled, variegated, and fossil of almost every variety of figure—to pure white, and which has lately yielded a very choice green, unmatched in beauty in the kingdom, of which here "self" and there veined with rich red, the bases of the pilasters are being made. None of the boasted foreign marbles will excel these Devonshire marbles in grandeur, and at the same time delicacy of effect over the Oratory will be a sight to see.

THE TRADE OF THE TYNE AND WEAR.

Aug. 18.—There has been some improvement in the Coal and Coke Trades during the past week. There is an increased demand for best steam coal, and enquiries for it for the Baltic for autumn delivery. The pits with few exceptions are working full time both for first and second class steam coal. In Durham there is also an increased demand for coal and coke. The gas collieries having mostly contracts to complete are generally well employed, and as there has been large arrivals of steam tonnage at the docks, the shipments both coastwise and oversea have been large. There is also a little better enquiry for coke. The exportation of fire-bricks has also been large during the past week. Chemicals and most other manufactured goods are also in increased demand, but not yet sufficient to increase prices to any great extent. With the exception of iron, the prices received for coal and most manufactured goods also continue comparatively low.

The report of the Consett Iron and Coal Company is again most favourable. The career of this remarkable company under the present *régime* has been most successful, and no doubt great credit is due to the managers, but in one respect they have been highly favoured. The original company which started these works erected blast furnaces, rolling mills, &c., and opened out coal and iron ore mines in the locality. Those iron ores being in connection with the coal measures, the ore was of good quality, but the expense of working was excessive, and a large sum of money was expended, the result being failure, and the present company secured the works for a comparatively small sum, and this is one of the causes of the great success achieved. They are not saddled with a large capital account, and a comparatively small profit enables the firm to pay 20 per cent., which they will do for the past year. The present company have brought the iron ores required from Cleveland, and a lesser quantity from the hematite fields in Cumberland. The works have been carried on in a most energetic manner. At one time the main manufacture was iron rails, but as this trade declined ship plates were made, and this is a very important branch of the business at present. All the coal and coke required are produced at their own works, and a considerable quantity of coal and coke also sold. The success of these works is certainly very remarkable, as there are many works much more favourably situated where only small profits have been made during the past few years.

The iron ship building trade on these rivers has got into a good position, and most of the works are well supplied with orders. It is apparent that if no untoward circumstance occurs this trade will continue good for some months to come. The advance of this flourishing trade has also contributed very materially to the general prosperity of the district, as the materials used in the construction of iron ships are nearly all produced here—ship plates in large quantities at Jarrow, Consett, on the Tees, &c., and marine engines and boilers are as a rule supplied to the ships built by the iron firms in the district, But now that this trade has got into a prosperous condition rocks appear ahead in the shape of demands from the men of higher wages. Notice has been given at several large works for an advance of 10 per cent., and some fears are entertained of a strike. There is, however, still ground for hope that such a calamity will be in some way avoided.

Attempts have often been made during the past year or two by the mineowners on the Continent, on the Rhine, Westphalia, Upper Silesia, &c., to cut out British coal in the Baltic and in the Russian market generally, but so far with very partial success. Representatives of the leading firms in those districts, as well as the railway firms concerned, have met in conference at Berlin to discuss the question, the object being to fix a tariff for the transport of coal which will enable them to compete with English coal. Up to the present time English coal is dominant in the North Sea and Baltic ports, and it also finds its way in considerable quantities to the inland ports. The cheapness of water carriage, together with the well-known qualities of English coal, render this possible. Last year Berlin imported 92,000 tons of English coal, and it is estimated that the total consumption of this coal in the Berlin district is 300,000 tons per annum. The conference alluded to was held under the auspices of the Prussian Minister of Public Works, and an important feature of the discussion was the possibility of reducing the cost of railway carriage for coal to the level of that of water carriage. The decision of the conference is not yet known.

The Iron Trade has been very quiet during the past week, and 43s. 6d. has been readily taken for No. 3 pig. Messrs. Connall and Co. report 92,000 tons in their warrant stores, or a decrease of 280 tons since last week. This shows that holders of warrants are selling out again, but makers generally are holding, expecting to get improved rates. The shipments of pig-iron from the Tees ports have been 17,651 tons, while the exports of manufactured iron and steel have been 2476 tons. In the iron foundry branches there is little change to notice, and prices are unchanged. The demand for finished iron is somewhat slacker, but prices are fairly maintained, the manufacturers being well supplied with orders. The value of ship-plates remains at 6*l.* 15s. to 6*l.* 17s. 6d., and puddled bars are in more request. At Middlesborough, on Tuesday, the market was very quiet, and there was no change in the value of iron. The finished iron trade, however, is in a better state. The activity of iron shipbuilding causes a large demand for plates, angle iron, and all other classes of manufactured iron. Bars have also improved lately in demand. It is fully expected that an increased trade will be done in these branches during the remainder of the year. Puddled bars are in good demand for America; there is a good inquiry for steel rails, and the works in the district are actively employed. There is some apprehension respecting the action of the men at the Tyne shipbuilding yards. There is little alteration in the Coal Trade. Prices are low. Coke is firm. Prices of manufactured iron are firm. Plates 6*l.* 15s.; bars, 5*l.* 17s. 6d.; angles, 6*l.* to 6*l.* 2s. 6d.

The progress made by the North-Eastern Railway Company—that is, the traffic receipts—affords a good idea as to the state of the mineral trades in the district. The increase in those receipts for the present year, as compared with the receipts in 1879, are, of course, illusory, owing to the occurrence of the coal miners' strike in Durham last year, but when compared with 1878 it is apparent that steady progress has been made during the present year, as there is a slight increase as compared with 1878. The total increase for the past seven weeks of the present half-year now amounts to 103,961*l.* over the corresponding weeks in 1879, and 4720*l.* over 1878. The total receipts for the seven weeks in the second half-year in 1878 were for minerals 284,526*l.*; 1879, 252,373*l.*; and 1880*l*, 306,955*l.*

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

Aug. 19.—The satisfactory change that has recently come over the standard trade of South Staffordshire can in no way be more markedly observed than by a comparison of the very few ironworks now standing with the large number that were a month ago idle. And the decidedly cheerful tone which characterised the weekly meetings of the trade in Birmingham to-day, and in Wolverhampton yesterday, was a further confirmation of the revival. Prices of all commodities except coal ruled firm. In pigs, although trade is steady, new business does not come in rapidly. Customers do not readily accept deliverances. Staffordshire all-mine is 3*l.* 10s. to 3*l.* 12s. 6d. and 3*l.* 15s. Part mine is 3*l.*, and best cinder pigs are reported to have changed hands at 2*l.* 10s., as compared with 2*l.* 7s. 6d., the price of the last two weeks. Ordinary cinder pigs are quoted 2*l.* 2s. 6d. to 2*l.* 5s. For Carnforth (West Coast) hematites 4*l.* at works is asked, with half-a-sovereign added for delivery into Staffordshire. Such a price almost totally excludes them from the works of this district. The orders booked at some of the leading finished ironworks during the week have not been numerous. Boiler-plates of known quality are 9*l.* 10s., but commoner sorts are to be had at 8*l.* 10s. Hoops sell at from 6*l.* 15s. to 7*l.*

A petition for exemption from the underground drainage clauses of the Mines Drainage Act has been presented to the Commissioners by the colliery owners of the Kingswinford district, headed by Mr. Fisher Smith, the Earl of Dudley's agent. As the earl owns most of the mines in this district he is of himself almost sufficiently powerful to secure the exemption; it is, therefore, expected that the petition will be granted.

Much satisfaction has been caused throughout the trading circles of South Staffordshire by an intimation which has gained credence, though the fact has not been officially announced, that the investigations of the South Staffordshire Mines Drainage Commissioners into the petition for the exclusion of the Tipton district are likely to result in the rejection of the petition, owing to the insufficient number of the signatures appended to it.

The directors of the Sandwell Park Colliery Company (Limited) in their annual report state that after deducting 2000*l.* for depreciation the net profits on the last year's working amounted to 10,841*l.* To this they have added 748*l.* brought forward from last year, making the total amount available for dividend 11,589*l.* Out of this the sum of 3108*l.* was absorbed by the payment of 5 per cent. interim dividend, leaving 8479*l.* They now recommend the payment of a dividend for the past half-year at the rate of 7½ per cent., which will take 4685*l.* The balance of 3793*l.*, equal to over 5 per cent., is to be carried forward. The shareholders and directors of the Hamstead Colliery Company (Limited) met in Wolverhampton on Wednesday, and confirmed the resolutions passed at a meeting, held in Birmingham earlier in the month, relating to the issue of 5000 preference shares of 20*l.* each. The nominal capital of the company will by this issue be increased from 160,000*l.* to 260,000*l.* It was estimated that two-thirds of the new capital would suffice to sink a second shaft, and put the pit in thorough working condition. This work would occupy about three years.

The colliers at many of the leading pits in North Staffordshire have given notice for an advance in wages of 10 per cent., but it is not likely that they will secure it.

A NEW MINING INDUSTRY FOR NORTH-WEST WORCESTERSHIRE.

While in some portions of the Black Country there has of late years been witnessed a decadence in the mining industry of the district, owing to many of the pits having been worked out, it is satsfactory to know that there are unmistakeable evidences that in the north-west portion of Worcestershire and the southern part of Shropshire a new mining industry will soon be opened up, which will beyond doubt find employment for thousands of persons, and effect a complete revolution in the social and material condition of that district. It may not be generally known that in the locality of the picturesque little parish of Arley, on the banks of the Severn, which forms portion of the county of Stafford, there are at the present time two or three collieries with a considerable weekly output of coal, and that at Bayton and in other portions of the Rock district there are other pits, the yield of which, however, are very limited owing to the want of railway communication. Some four or five years ago an attempt was made by the Diamond Boring Company to find coal in one portion of the immense Bewdley Forest, near to Dowle's Brook, but after working with secrecy for some time the experiment was abandoned. The opinion, however, has long been entertained by geologists that all over the extensive Wyre Forest, which stretches from Bewdley on the north to beyond Cleobury Mortimer on the south and below Highley on the west, and within a short distance from the surface lay concealed a vast source of wealth, in the shape of coal and iron-stone fields, and events which have recently transpired have proved the accuracy of these scientific speculations. Prof. Molyneux has expressed an opinion that the coal field in the Wyre Forest measures nearly 18 miles in length and 7 miles in width, and as coal crops up here and there all over the forest, no doubt the opinion will be verified in practice. One thing has been abundantly proved, that in the two places where the earth has been tapped to the depth of about 200 yards a splendid seam of coal 17 ft. thick, a fire-clay bed 7 ft. thick, and an ironstone bed 3 ft. deep, has been penetrated, and an analysis of these minerals proves beyond doubt that they are of very good quality. The coal is admirably adapted for domestic and manufacturing purposes, the fire-clay is declared to be equal to that worked at Stourbridge, while the ironstone is spoken of as equal in quality with the best produced from the South Staffordshire and South Wales workings. The land on which the shafts have been sunk belongs to the Duke of Cleveland, and is in the parish of Billingsley, about three miles from the Highley station, on the Severn Valley Railway, It is asserted that the mine is free from water and explosive gas, and altogether bids fair to prove a source of untold wealth to those who have taken up the work. A movement is now on foot for starting a company, similar to the Sandwell Colliery Company, with the view of developing the mines, and a meeting of influential and wealthy gentlemen has been held within the last few days, when steps were taken in this direction.

— *Wolverhampton Chronicle.*

REPORT FROM NORTH WALES, SALOP, AND CARDIGAN.

Aug. 18.—At the adjourned inquest upon the fatal accident at Trefonen Colliery, the jury found a verdict of "Accidental Death." Mr. Wynne, Her Majesty's Inspector of Mines, checked the proprietor, Mr. France, in an attempt to insinuate that the deceased man was drunk. Operations are in progress at the Bersham Colliery, under the direction of the engineer, assisted by Her Majesty's Inspector of Collieries and the neighbouring colliery engineers, for the recovery of four missing bodies, and the restoration of the colliery to working order. Two of the bodies have been recovered. A public meeting has been held at Wrexham for the purpose of establishing a fund for the relief of the widows and families of the deceased. Mr. James Sparrow, of the Ffwd Ironworks, heads the subscription with 200*l.* Sir Watkin W. Wynne and others of the neighbouring gentry have also promised subscriptions. The railways in Wales have suffered very much from the recent storms, traffic having to be suspended in some cases, but the needful repairs have now been accomplished, and traffic resumed. It says a great deal for the way in which railways have been constructed in this mountainous country that so little damage, comparatively speaking, has resulted from the heavy rains of this summer.

The railway wagon works are well employed. The Midland Carriage Company, whose works are at Shrewsbury, have declared a dividend of 6 per cent., carrying a balance forward.

Although it has fallen to my lot to be unjustly suspected of hostility to the Llanrwst Lead Mine, no reader of the Journal is more sorry than I am that the company has had to resort to liquidation. It does seem strange, however, that with all the wealth said to have been discovered at the mine, and with which we have been made familiar in these pages, this undesirable result should follow. It is pleasant to see that between 4000*l.* and 5000*l.* worth of ore has been sold from the Cambrian Mines. One naturally hopes the time will come when this amount will be increased tenfold, as it must be before ordinary interest can be paid on the amount of the purchase money paid for the mines.

The Welsh seem to have waked up to the importance of sanitary measures. On all sides we have accounts of new sewage works, and works for the supply of pure water to towns and villages, coming to us. Might not a tax be levied on large foreign abstractors of water from the Principality, like the Liverpool people, for example, which might be properly applied to public works in Wales? The first instalment of the work for the Liverpool water supply at Llanwddyn is to be begun at once; this will naturally create employment for men in a district where it is much needed. All mines and quarries languish in that region for want of railway communication. Mr. Humphrey's letter on a narrow-guage railway from Wrexham appears *in extenso* in the Wrexham Advertiser. He has an Herculean task before him in trying to awake the interest of the inhabitants in his scheme. The Universal Sewage Company, who a year ago erected works at Oswestry for the utilisation of the solid parts of the sewage, have issued their first report, and declare a dividend of 6 per cent.

REPORT FROM DERBYSHIRE AND YORKSHIRE

Aug. 19.—In the lead mining district business has been going on much as usual, the production of ore being kept up to the average. That, however, it may be said, is small compared with the number of mines that are opened out. But there are really but few that can be said to be of any extent, many being worked by ordinary miners on their own account, and in the most primitive manner, and, of course, without capital. So long as this is the case, no progress can be expected. The iron trade continues tolerably good, there being a large production, whilst the price of pig is firm. A large tonnage of ironstone continues to be imported from Northampton *via* the Midland, so that not much attention is paid to the local stone. House coal is in but moderate request, and the price at which it has to be sold does not leave much, if anything, in the shape of profit, and no change for the better is likely to take place for some time at least. Some few of the collieries have been doing a tolerably fair business with the Metropolis, but the exports in other directions are comparatively light. Steam coal meets with a steady sale, an increased tonnage being used for locomotive purposes. Engine fuel is in but moderate request, but there is a large production of coke, which it is not hard to dispose of. Steel rails are active at the works at Dronfield, and there is every appearance of their continuing so.

In Sheffield business continues good in nearly every branch, and there is every appearance that this state of things will continue to the end of the year. The mills engaged in rolling plates and sheets have been running well, whilst makers of Bessemer rails have plenty to do, and it is not unlikely that an advance in the price will be made before long. Telegraphic and other wire, as well as most descriptions of railway material, are in steady demand. In crucible cast-steel more of late has been done, and this important branch of our local trade promises to become more active than it has been. In general cutlery a steady business is being done, more particularly as regards the best qualities of table knives, but there is scarcely so much doing in files as there was a month or two since. Makers of light agricultural implements have been doing well, but the season is now drawing to a close. Skate makers have also become rather more active than they were. In heavy armour plates there does not appear to be so much doing, but this in all probability is caused by the knowledge that the steel-faced plates—some of which are being tested—will take the place of iron for our own war vessels, seeing that they are not only superior in every way but will be actually as economical. There has been a large production of pig in the district, and prices have gone up, more especially for hematites for the Bessemer converters. The coal trade of South Yorkshire is still dull; prices low, and short time the rule. Households are not easy to sell, although offered at a price that does not leave any profit whatever, and in many instances causes a loss. But the pits have to be kept going, if only to keep the working places and the roads in a proper state. Steam coal, as is usual at this period of the year, is in request for shipping, a good deal for that purpose being forwarded to Grimsby.

At the Barrow Colliery, near Barnsley, the men are still out, and are obtaining subscriptions from the public. Four men were brought from Mold, in Flintshire, to work at the pit, but they were warned by means of stones that there was a strike, or something like it, going on. They then fraternised with the old hands, who subscribed sufficient money to pay their railway fares back, and they were seen off at Barnsley.

At the Hoyl and Silkstone Colliery there has been a dispute with respect to one of the check-weighmen. One of the pits, it is said,

will be laid down and notice given to the men, who on being re-engaged will have to sign a new agreement. The colliery is one of the largest in the district, well known for the excellent quality of its house and gas coal, as well as coke.

REPORT FROM LINCOLNSHIRE.

Aug. 19.—A steady business continues to be done at the works in North Lincolnshire, and of late a large quantity of pig has been sent away, so that stocks have sensibly decreased. A good deal has found its way into Lancashire, the delivery price at Manchester being about 51s. with the usual deduction. The Frodingham Company's iron is well known, and of late the production has considerably increased, whilst the quality, by careful manipulation of the stone, which in the neighbourhood of the works is of a most peculiar character, is much better than what it was when the stone was first discovered and converted. The large amount of limestone in the ores requires more handling and mixing. The Lincolnshire Iron Smelting Company with two furnaces have been doing well, and there is every probability that the next balance-sheet will be about the most satisfactory there has been. The heavy losses at first it is to be hoped will be recovered, for the directors have done everything in their power to make the company a paying one, whilst some time since they obtained a valuable concession from Mr. R. Winn, M.P., the lessor of the minerals. The Appleby Iron Company, of which Mr. W. J. Roseby is the managing director, has been turning out a heavy tonnage of iron, using a considerable tonnage of the stone from the mines near to the City of Lincoln, which is undoubtedly the richest in the county; besides which it is comparatively free from limestone, and is consequently largely used for mixing with the stone worked in the Frodingham district, which has more than is required for smelting. At the Redbourne Hill and the other works in the same locality, business has been very fair, and the production of iron up to the average. It may here be stated that a good deal of stone has been sent away by Mr. Roseby, who it is understood is now working on his own account the furnaces of William Cooke and Co. (Limited), Tinsley, near Sheffield. There has been no decrease in the tonnage of stone sent into other districts from Lincolnshire, for it is now extensively used in both South and West Yorkshire, as well as in Derbyshire and other iron-making districts.

The West Yorkshire Iron Company have five furnaces a few miles from Leeds, and the stone there used is almost exclusively being brought from Claxby, in the Market Rasen district, where it is of a good solid character, and it differs from the Frodingham stone, there not being an excess of limestone in it. The Parkgate Iron Company, who have furnaces and mills near to Rotherham, have raised a considerable tonnage of the stone at Gunbrose, in Frodingham district. At Greetwell and Monks' Abbey, near to Lincoln, the stone is the most valuable, and a large tonnage is raised, a good deal being sent along the railway to the works in North Lincolnshire as well as into Yorkshire. Mr. Winn also raises stone on his own account, his agent being Mr. John Roseby, who was the first to introduce the stone to some of our ironmasters before any furnaces were built in the county. Near to Frodingham the stone has also been worked by the Staveley Company, whilst the Kiveton Park Company have a field at Kirton, near Lincoln. The iron made from the mixed stone is of a singularly fluid character, and is in request for forge purposes in particular, and is frequently mixed with Cleveland, as a substitute for Scotch.

FOREIGN MINING AND METALLURGY.

There is little if any change to report in the French coal trade. Preparations are being made for the winter season, and there are some anticipations of an advance. Household coal is quoted at about 2*l.* per ton delivered at Paris. A small contract for 75 tons required for the Belgian Ministry of Agriculture and Commerce has been secured by the Anzin Company at 29s. per ton. A contract is to be let at Paris on Sept. 4 for 82,500 tons of briquettes, required for the French State Railways. There is little change to report in the general aspect of the Belgian coal trade. The collieries have generally resumed work on Mondays, but several of them still show little desire to force their production. The demand has become decided, and purchasers are endeavouring to secure long-termed contracts, into which, however, colliery proprietors decline to enter. The sugar making season is expected to be a good one, and this fact will probably exert a favourable influence upon the Belgian coal trade. Prices have not materially varied, but at the same time they have been maintained with considerable firmness. In the Hainaut the situation remains favourable, and industrial coal is in good demand. The same may be said of the Mons basin. The general aspect of the German coal trade is favourable.

Transactions in iron have become somewhat more numerous in the French department of the Haute-Marne; many offers of orders have especially come to hand during the last few days, although the prices named have been too low to be acceptable. There are evidently requirements to satisfy; but merchants, believing in a continuation of a downward tendency, hesitate to do business. Some affairs have, nevertheless, been carried through. Most of the rolling mills of the Haute-Marne have still tolerably well filled order books, and they are enabled, in consequence, to show more firmness than other groups. Merchants' iron from coke-made pig has been dealt in at 8*l.* per ton in transactions of some little importance; in smaller affairs 8*l.* 4s. to 8*l.* 8s. is asked for. Mixed iron is worth 16s. per ton more than coke-made. The competition of the Nord still exerts some influence on prices in the Haute-Marne. Although there has been a pretty good demand for sheets prices have not experienced any improvement. In the South of France quotations for this article have been rather more depreciated than in other districts. Some rather good orders have come to hand for wire. The Northern of France Railway Company has contracted with the Denai and Anzin Works for a supply of 100,000 tons of steel rails, at 7*l.* per ton.

In the Belgian Iron Trade former quotations have been generally maintained. Upon the whole, the tone of business continues firm, and prices have shown, if anything, an upward tendency. Any upward movement is checked by the fact that some of the less well-established works are still obliged sometimes to go below current rates in order to secure employment. These are only exceptions, but still these exceptions occur. No. 2 plates are quoted at 7*l.* 4s. per ton, No. 3 at 8*l.* per ton, and No. 4 at 11*l.* 4s. per ton; the demand may be said to be active. Pig of good marks is quoted at 2*l.* 12s. per ton. Iron has been quoted at 5*l.* 12s. per ton, and this with some firmness and stability. The Administration of the Belgian State Railways will let the proposed contract for 1000 trucks on the 28th inst. An application for a credit for 50 additional locomotives is about to be submitted by the Belgian Minister of Public Works to the Chamber of Representatives. This application will, in all probability, be granted. The general aspect of the Austrian iron trade is considered to have much improved.

SOCIETY OF ENGINEERS.—The volume of Transactions for 1879 has just been issued through Messrs. E. and F. N. Spon, of Charing-cross, and contains as usual a large number of interesting and thoroughly practical papers, calculated to prove of great value to the profession. The inaugural address of the President—Mr. Robert Paulson Spice—is followed by nine papers by various members, including those by Mr. C. J. Alford on the Mineralogy of the Island of Sardinia, and by Mr. Thos. Andrews on the Strength of Wrought Iron Railway Axles, to each of which the Council awarded their premium of books. The other papers are on the New Pits and Hauling Machinery for the San Domingo Mines in Portugal, by Mr. Joseph Bernays, vice-president; on Modern Machinery for Preparing Macadam for Roads, by Mr. Chas. E. Hall; on Hydraulic, Continuous, and Automatic Brakes, by Mr. Edw. D. Barker; an appendix to Mr. Alford's paper, embraciug the laws, decrees, and regulations relating to mining operations in the old kingdom of Sardinia. In connection with this it should be mentioned that "beni immobili" and "beni mobili" simply mean real property and personal property respectively, and do not refer to the removability of property "from under the jurisdiction of Italian law," as Mr. Alford puts it. This leads him into some slight errors in other parts of the translation, and it would be interesting to know whether the words in parenthesis, in section 50, are in the Act or are a translator's note. The next paper is an account of the vacation visits, of which four were made during the year, and there are also papers by Mr. A. W. Jones on Modern Tramway Construction; and by Mr. Henry Robinson on Sewage Disposal. The papers are well illustrated when necessary, so that the volume secures the utmost possible advantages to members unable to attend the meetiags, and is well worthy of a place in any professional library.

Registration of New Companies.

The following joint stock companies have been duly registered:—

TEMPERANCE AND GENERAL ADVANCE AND INVESTMENT COMPANY (Limited).—This company was registered on Aug. 7, with a capital of 10,000*l.*, in 5*l.* shares, to transact the usual business of a bill discounter, bill broker, and money lender, and of an investment company. The subscribers are—Edward Hirschorn, 26, Bishopsgate-street, accountant, 1; Frank Stone, Manor Park, Essex, accountant, 1; Thomas Matthews Cridge, Crouch End, N., solicitor, 1; Lieutenant T. F. Kynnersley Gardener, Trowbridge, Salop, 1; James Wells, Little Ilford, Essex, accountant, 1; H. J. Bull, Woodlea-road, Stoke Newington, estate agent, 1; J. D. Hobson, Romford, Essex, accountant, 1. The number of directors is not to be less than three nor more than seven. Qualification, five shares. The first four subscribers are the first directors. The company in general meeting will determine remuneration

THE EASTERN AND AUSTRALIAN STEAMSHIP COMPANY (Limited).—Capital 200,000*l.*, in shares of 10*l.* To acquire the goodwill and business of a company in liquidation, and to carry on the business. The subscribers (who take one share each) are—G. Guthrie, 34, Leadenhall-street; M. F. Davison, 116, Queen's-road; W. Mactaggart, 34, Leadenhall-street; T. Scott, Idol-lane; P. F. Tidman, 34, Leadenhall-street; H. Stubbins, 34, Leadenhall-street: W Wirell, 34, Leadenhall-street.

THE INCORPORATED DIAMOND MINING COMPANY (Limited).—Capital 200,000*l.*, in shares of 20*l.* The acquisition and working of mining claims in diamond mines situate in South Africa, and that of all houses, premises, lands, claims, mines, works, machinery, plant, or any grants, concessions, leases, or other interests connected therewith. The carrying on the business of miners, prospectors, buyers and sellers of diamonds and other precious stones or metals, and that of diamond merchants, brokers, and cutters. The subscribers (who take one share each) are—A. Goldschmidt, Grand Hotel, diamond merchant; S. W. Paddon, 104, Hatton Garden, diamond merchant; T. Lewis, 104, Hatton Garden, diamond merchant; R. T. Hattey, 16, Devonshire-square, solicitor; G. M. Hewett, 13, Holford-square, gentleman; S. Marks, 104, Hatton Garden, diamond merchant; T. R. Bradbury, 104, Hatton Garden, clerk. The following are the first directors:—Messrs. Goldschmidt, Paddon, Marks, and J. E. Dell, the qualification being fixed at 50 shares.

THE EQUITABLE FIRE RE-INSURANCE COMPANY (Limited).—Capital 500,000*l.*, in shares of 10*l.* To grant re-insurances upon any description of property against loss or damage by fire. The subscribers (who take 100 shares each) are—R. Haworth, Manchester; J. Musgrave, Bolton; H. Brooke, Huddersfield; R. H. Lord, Bolton; R. H. Hutchinson, Blackburn; J. Tweedale, Rochdale; F. H. Bowman, Halifax; J. Whittaker, Bolton; T. Noton, Rusholm; J. Clegg, High Crompton; J. Rowland, Oldham; W. Wright, Salford.

THE EAST ANGLIAN FISHERIES (Limited).—Capital 100,000*l.*, in shares of 5*l.* To carry on the business of fishing-smack owners, fish carriers, traders, and dealers. The subscribers (who take one share each) are—S. Hewett, 110, Lower Thames-street; G. W. Hutchinson, 2, Great Winchester-street; R. Crawley, 40, Great Marlborough-street; A. Hutchinson, 7, Finsbury-circus; H. J. Haxell, Erith; F. H. Patterson, 223, Charterhouse-square; E. J. Turner, 16, Gilston-road; T. Linsdell, 1, Gresham Buildings.

THE CHEMISTS AND DRUGGISTS ASSOCIATION (Limited).—Capital 50,000*l.*, in shares of 5*l.* To carry on the business of wholesale chemists and druggists. The subscribers (who take one share each) are—A. P. Barr, 42, New Broad-street; C. Heiz, 2, Bloomsbury-street; J. H. Stephenson, 26, Suffolk-street; A. Matthews, 7, Mark-street; E. D. Oppert, 63, Bartholomew Close; M. Scott, Acton; N M. Byers, 43, New Broad-street.

THOMAS SPITTLE (Limited).—Capital 80,000*l.*, in shares of 10*l.* To acquire and carry on an engineering business belonging to T. Spittle, situated in Monmouthshire. The subscribers (who take one share each) are—T. Spittle, Newport; T. Spittle, jun., Newport; J. Spittle, Newport; E. Hunt, Newport; W. Spittle, Newport; A. Townsend, Newport; H. Bythway, Pontypool.

CORRWG FECHAN COAL COMPANY (Limited).—Capital 30,000*l.*, in shares of 50*l.* To acquire by purchase or otherwise certain collieries and mineral properties known as Corrwg Fechan Collieries, situate in Glamorganshire, together with the veins, seams, and beds of coal, culm, iron ore, ironstone, blackband, and fireclay attached thereto, and also the tramways, stock-in-trade, chattels, effects, &c. To extend the working of the said collieries and mineral properties, and build, construct, and maintain all buildings, machinery, &c., that may be deemed necessary, and generally to carry on the business of colliery and mineowners in all branches. The subscribers are—R. V Leach, Devizes, gent., 50; H. A. Bartlett, Great Yarmouth, gent., 50; H. Nash, Liverpool, merchant, 50; P. W. Flower, Briton Ferry, manufacturer, 50; F. D. Wickham, Bath, gent., 20; R. Phillipps, Neath, manufacturer, 40; W. Flower, 1, Great Winchester-street, solicitor, 1. A director's qualification is twenty shares; the board must not exceed seven members, or be less than four.

THE INDIAN MAMMOTH GOLD MINES (Limited).—Capital 150,000*l.*, in shares of 1*l.* To adopt and carry into effect a certain agreement made between E. M. Cookesley on the one part and A. C. Duvall as trustee for the company, in respect to a property situated in the Wynaad district, Presidency of Madras, extending over an area of two square miles, for a term of 48 years, renewable for ever, and to work and develope this property, and exercise all the mining and other rights referred to in the said agreement, and generally to carry on the business of a gold mining company. The subscribers (who take one share each) are—M. Hearn, 42, Woburn-place, architect; C. E. Couradi, Brockley, accountant; W. J. Smith, Lee, clerk; W. F. Tilsley, 3, Abchurch-yard, solicitor; A. Halett, 11, Queen Victoria-street, gentleman; A. K. Mackinnon, 1, Gloucester-street, surveyor; J. Simpson, Clapham, agent. The first directors are Generals E. K. Money and G. E. Thomas; Hon. J, T. Fitzmaurice, Messrs. J. Goodson, and J. Humphreys, whose qualification is 50 shares.

THOMAS MURRAY AND COMPANY (Limited).—Capital 25,000*l.*, in shares of 20*l.* To acquire engineer works and foundries at Chester-le-Street, and to continue and develop the business. The subscribers (who take one share each) are—J. Mitchell, Chester-le-Street; T. M. Swinburne, Gateshead; T. Robson, Lumley Thicks; G. Davidson, Gateshead; J. W. Robinson, Manchester; J. W. Swinburne, Gateshead; G. W. Honeyman, Gateshead.

THE COLAR GOLD MINING COMPANY (Limited).—Capital 150,000*l.*, in shares of 1*l.* To search for gold and other minerals, and precious stones, in Mysore, India, and elsewhere, and to seek, win, open, and work gold and other mines; to raise, sell, and dispose of the different ores, minerals, and precious stones to be procured therefrom; and to convert such ores into metal, and generally to carry on the business of a gold-mining company. The subscribers (who take one share each) are—A. Lindsay, 14, St. James's-square, retired colonel Indian Army; A. H. Anderson, Glasgow, Esq.; R. Gamble, 5, East India-avenue, clerk; T. D. Sargeant, 66, Redcliffe-road, Esq.; R. Knight, 11, Haroldstone-road, clerk; R. T. Bostock, Lee, accountant; S. Tiddy, 110, Cannon-street, accountant. The first directors are Col. Lindsay, General J. H. Pearse, and A. H. Anderson, Esq. The number of directors not to be less than three or more than nine.

THE CRAVEN BANK (Limited).—Capital 1,200,000*l.*, in shares of 30*l.* To carry on banking operations generally, and particularly in Lancashire and Yorkshire. The subscribers (who take 200 shares each) are—W. Morrison, Leeds; J. Slingsby, Skipton; R. Shaw, Colm; J. B. Dewhurst, Skipton; R. L. Hattersley, Keighley; J. Haggas, Keighley; G. Robinson, Skipton; G. Robinson, jun., Skipton.

UNIVERSAL SHIPPING AND INSURANCE CO-OPERATION (Limited).—Capital 200,000*l.*, in shares of 5*l.* To carry on an insurance business in connection with sundry shipping interests. The subscribers (who take one share each) are—A. R. Poste, 2, Talbot-court; R. Pratt, Southampton; J. W. Cole, 54, King William-street; A. S. Winn, 54, King William-street; T. H. Glover, 3, Leadenhall-street; C. Lintoll, 5, New City Chambers; R. F. Gladstone, Raleigh Club.

THE DEVALA-PROVIDENT GOLD MINING COMPANY (Limited).—Capital 75,000*l.*, in shares of 1*l.* To acquire an estate situate in the south-east of the Wynaad, Nilgiri, Madras, and all the mining rights and privileges connected therewith, upon the terms of a certain agreement entered into between H. E. Coe, of the first part, and F. C. Evans for the company. To carry on the business of mining and working gold, gold quartz, and other metals and minerals, preparing the same for the market, and generally to carry on the business of mineowners, metallurgists, metal workers, and dealers; also that of planters and growers of coffee. The subscribers are—E. T. Henman, 16, Bethune-road, stationer, 100; E. C. Burgess, Belvedere, accountant, 100; W. J. Smith, Eltham, brewery valuer, 100; G. F. Jenkins, 93, Stockwell Park-road, manager, 100; G. Revill, Clapham, gentleman, 100; F. N. Mackay, South Norwood, engineer, 100; F. Robins, 69, Cambridge Gaardens, gentleman, 20. The number of directors must not exceed ten, or be less than four, the qualification being fixed at 100 shares.

CARLISLE AND CUMBERLAND BANK is now incorporated under the Limited Liability Acts

Meetings of Public Companies.

WESTERN ANDES MINING COMPANY.

A meeting of shareholders was held at the offices of the company, King-street, Cheapside, on Wednesday,—The CHAIRMAN of the company presided.

Mr. THOMAS JERVIS (the secretary) read the notice convening the meeting.

The CHAIRMAN said the figures in the report showed the profit of the year 3354*l.* The interest on the securities would be 302*l.*, making a total of 3656*l.* There had been written off from that on account of new work executed in former years 480*l.*, leaving 3176*l.* They had paid the late superintendent's journey home expenses (107*l.*); there were the expenses in London, salaries, and auditors' fees (47?*l.*), leaving a balance of 2039*l.* of net profit. This result had been arrived at from the working of the last seven months of the year, the first five months having resulted in loss; but he thought those losses, which were of an exceptional character, not likely to occur again, and, therefore, the directors hoped that in future there would be continuous profits. Out of the 2039*l.* of profit the directors proposed to pay a dividend of 2s. 6d. per share, which left a small balance to carry forward. In conclusion, the Chairman moved the adoption of the report and accounts.

The resolution was seconded and carried without any discussion.

The CHAIRMAN said that Mr. Percy Brandon, the vendor, would make a statement regarding the mines.

Mr. PERCY BRANDON then addressed the meeting as follows:—As the state of the company's affairs has now improved I will, with your permission, as the vendor of the property, give a slight explanation of the result of the working of the mines since the formation, now seven years since, with the view to enable you to form some opinion of the future. During the past four years I have found myself in a, to me, unpleasant position, because at the time of selling the property I guaranteed to the shareholders a minimum dividend of 12 per cent. per annum during three years, and no sooner had that term passed than the property ceased to yield a sufficient profit to allow of the payment of any further dividend; therefore, although during the three years instead of 36 per cent. being paid, the shareholders actually received 57 per cent., yet those who do not know me might think that I had calculated that there was sufficient mineral only for the three years, and in consequence I limited the guarantee to that time, not caring about anything beyond. I think that you will exonerate me from that when you have heard the explanation that I propose to give, and I tell you that I still hold more than three-fourths of the shares, notwithstanding that opportunities have offered of disposing of many of them, The profits made by the company during the seven years has been 58,400*l.*—a sum equal to about 78 per cent. of the capital of the company. Of this sum the profit of the first three years (say, from May, 1873, to April, 1876) was 54,553*l.* 19s. 5d., which was disposed of as follows:—London expenses, 3612*l.* 7s. 11d.; reserve fund, 8000*l.*; paid in dividends, 41,805*l.* 15s. 8d.; leaving a balance of 1135*l.* 15s. 10d.=54,553*l.* 19s. 5d. In 1876 a disastrous revolution commenced, which lasted until about the middle of 1877, the results of which were an upset of the whole. In 1876-7 the profit was only 1279*l.* 13s. 1d.; in 1877-8 we lost 1499*l.* 13s. 2d.; in 1878-9 the profit was 995*l.* 19s. 7d.; and in 1879-80, 3070*l.* 3s. 10d.; total profit, 5345*l.* 16s. 6d.; deduct loss, 1499*l.* 13s. 2d.; and there remains a credit balance of 3864*l.* 3s. 4d. The price of silver made some difference in the results. In 1873, when the company was formed, the price of fine silver was 64d. per ounce, and during the first two years it averaged 62½d., but from May, 1876, to April, 1879, it only averaged 57d. per ounce, which makes a difference of 10·40 per cent., or a loss to the company in four years of about 6000*l.* In 1879-80 the difference was made up by a rise in the exchange at which the bills on London were sold. Out of the sum of 3864*l.* 3s. 4d. gained in the last four years, the expenses in London have been paid, which are as follows:—In 1876-7, 962*l.* 15s. 7d.; 1877-8, 920*l.* 1s. 7d.; 1878-9, 582*l.* 12s. 9d.; 1879-80, 487*l.* 5s. 8d. Of the sum of 3000*l.* placed to reserve, about 2000*l.* was taken to pay preliminary expenses. Another almost equal sum has been taken for the purchase of lands; the sum of 3440*l.* was invested, and the balance of about 560*l.* was used with the working capital to replace an equal sum that has not yet been paid of the original capital. The financial position of the company on April 30 last may be taken to have been as follows:—Cash surplus, proceeds of gold and silver, 5957*l.* 6s. 11d.; cash in Marmato and here, 2131*l.* 14s. 9d.; value of stores (amount standing on books being 440*l.* less than cost), 4778*l.* 2s. 7d.; value of mules and furniture, 124*l.* 5s.; investments, 1735*l.* 9s. 10d.; sum due for calls, 340*l.*; sums due from various, 801*l.* 19s. 11d.; total, 15,868*l.* 19s.; deduct sums due by the company, 2568*l.* 8s. 7d.; and there remains to the good, 13,300*l.* 10s. 5d. Against this the only sum that has to be paid in the future is that standing to the debit of new works account, 448*l.* 1s. 10d., such amount barely representing the sum laid out on new works during the past year. All previous outlay has been written to cost. The amount standing to the debit of this account on May 1, 1877, was 1228*l.*; 1876, 1520*l.*; 1879, 928*l.*; and 1880, 448*l.* Generally, the cost of new works erected, in addition to an establishment, are charged to the capital account. This we do not do, but we liquidate the cost gradually, and have charged to expenses during the last four years more than 3000*l.* that have been laid out on such works. As regards the capabilities of the mines and the management of them, I must divide my remarks, taking first the Marmato or gold-bearing lodes, which have caused a loss ever since the middle of the year 1876-7, when, owing to the revolution, we could not obtain the necessary labour. When I transferred the property it was under the management of two able men, one of whom retired at the end of the first year, and is since dead, and the other came home at the end of the second year. During those two years the profits averaged about 400*l.* per month. After that the management devolved upon the head captain, who has proved himself incapable, as the result only too plainly shows. The profit fell to an average of 74*l.* per month during the next eight months. I, owing to this, went out, taking with me a new superintendent, and remained on the establishment three months, when the average monthly profits rose to nearly 200*l.*, and I expected a further improvement, but then came the revolution, and from that time commenced the losses, which during the revolution averaged 153*l.* per month, but which, as soon as it came to an end, and the miners commenced returning, instead of being diminished were augmented, and from then until the end of 1878 (21 months) they were more than double. Those who were managiug the property wanted to lay the blame to the mines, but it would be a most extraordinary thing that the mineral should just have held out until the men were taken away and then changed. The cost was so high and the loss so heavy in 1878 that I resolved to go out again, and took with me another superintendent. I then found that to re-establish the works as they were in the year 1876 would take time and cost money, as it was evident that for some time previously they had been carried on anyhow, and the question to be considered by me was what would be the best method to set about it. I consulted with the superintendent, and came to the conclusion that it would be best to drive a cross-cut from a gully to the south of the hill that should take its direction north, as by that the lodes which run east to west by north must be cut. By this we should save the great expense of maintaining the long extraction levels, as the mineral taken out by the cross-cut will be carried to the mills outside. This cross-cut had been driven on April 30 25 fms., partly through hard rock. We also turned our attention to finding mineral for the mills during the unproductiveness of the cross-cut, and we resolved to try working outside stuff, hoping to obtain sufficient of a fair quality to pay our cost, but unfortunately that has so many drawbacks, particularly during the rainy seasons, that it has not turned out so well as we hoped. Some of those mines are now let on tribute, and are yielding a profit. I also think that it would be advantageous to allow washing on any part of the establishment not worked by the company, on the condition of selling the gold to us at a fixed price, and I have written to the superintendent upon it. While I was at Marmato the superintendent was very desirous of putting up a pyrites mill by which to treat the tailings as he anticipated, making a sufficient profit out of them to cover our losses. I gave permission for its erection, and it should now be finished. Altogether, however, I think that the prospects are a speedy return to prosperity. I will now revise the doings at the silver mines and at the Aguas Claras Works. The profit per month during the first two years averaged about 1300*l.*, but in the third year it fell to 680*l.* The same influences were at work as at Marmato, and in 1877-8 the profits fell to an average of 100*l.* per month. One of the reasons of this falling off was certainly the change that took place in the mineral at the Pantano Mine, which contrary to the usual state of things got poorer in depth. In continuing our work at this mine impediments were met with, one of which was a mass of black shale, 30 fms. of which has been driven through, but knowing that the hill contains much mineral we never despaired of obtaining a good

result, and it now seems as if we may be repaid, as after passing the shale some little distance a cross-cut south was driven, and at the end of 4 fms. a lode was met with. From the captain's last report, dated June 7, this lode is 6 ft. wide, and has something like 200 fms. of backs, solid ground. He does not give the quantity of mineral that the lode carries, but he states that there must be sufficient for years to come. The superintendent gives the result of some assays that he had had made, which show an average of nearly 90 ozs. per ton of silver. He also states that some of the mineral shows gold. Had my instructions as to works for obtaining reserves been carried out there would not have been such a falling off in the results, for the quantity of mineral in that neighbourhood is inexhaustible. In the beginning of 1878-9 the lode now called San Antonio lode was pointed out to the captain, and it was worked, the result being that in driving one of the levels some bunches of mineral were met with that were so good that they raised the profits during seven months to an average of about 500*l.* per month. A lower level was then commenced, but when I was at the mines, as I found the minerals varying very much, and that this level would take a long time before it could reach the lode, I gave instructions to drive an intermediate cross-cut at a more favourable spot that I saw. After I left the mines things went wrong for some months, but last October, the lode having been reached in the intermediate cross-cut, some good mineral was found sooner than anticipated, as they had not driven far enough to be under the bunch found in the level above. The result of finding that, and the works carried on in consequence, has been that from October to April last, both included, the profits have been no less than 5650*l.* The monthly product varies, and lately it has been influenced by a slip in the extraction level of the Pantano Mine, but from the report of May 30 last I should say that from now forward it is likely to improve, as the extraction level was again clear, and the bunch of good mineral in the cross-cut of the San Antonio Mine had been reached. One of the principal works that I ordered to be carried out, as far back as 1873, and of which I have spoken, is the cross-cut in the Echendia Hill, now called the New Brandon cross-cut. Had my instructions been followed, instructions often repeated, the San Antonio lode would have been met with some time previous to its being pointed out, and the falling off in the silver obtained never would have taken place. That cross-cut is now being carried on, and the last report upon it was that two lodes are seen on surface, both of which must be cut previous to reaching the San Antonio. The lodes all have an underlie much to the north. The present end of the cross-cut is 10 fms. north of a perpendicular line from the spot where the first lode is seen on surface, so that, although the underlie is great, the end cannot be far from the lode. The second lode seen on surface is about 36 fms. north of the first lode, and the San Antonio is again about 27 fms. north of that, so that should the underlie be the same of all three lodes, which is most probable, we shall only have to drive about 70 fms. in order to cut the two new lodes and the San Antonio. Now, if you look at the results of the San Antonio lode as worked up to the present time—that out of the level alone mineral was taken which raised the profits in eight months to an average of nearly 500*l.* per month, there having been during the previous eighteen months only about 80*l.* And, again, that out of the cross-cut and its workings previous to arriving at the bunch of mineral found in the level above, a profit of 5650*l.* was obtained in seven months, instead of a loss of about 1800*l.* which occurred during the previous five months. I think that you will acknowledge that I had some reason in stating, as I always have done, that I anticipate finding great riches in that hill. The average product during the first three years from the silver lodes was 10,790 hard dollars per month; during the last six months it was 10,602 hard dollars. Owing to the bad results of the general working of the property for some time the carrying on of the unproductive work was suspended, but these will now again be prosecuted. Lately two new mines in different parts of the property have been discovered, one at Aguas Claras, a manta lode, and the other at a part called the Candelaria. This latter one is being opened with vigour, as the superintendent, unaccustomed to the aspect that lodes sometimes present on the surface on that property, was a little carried away by the first assays, some of which showed 1000 ozs. of silver per ton. He is very sanguine about this mine, and certainly the chances are just as good that it turn out rich, as the contrary; a few months will show. The prospects of this part of the property could hardly be better, for we have the works at the Pantano re-established in solid ground. The San Antonio, which must give good results from that part, now open for at least from two to three years. Then we shall have the first lode in the Echendia, and the lower workings on the San Antonio, which will be commenced at once. In succession we shall have the second lode in the same hill, and at the same time we shall have whatever may turn up from lodes on which work has been, or will soon be, renewed—say, the Jacksons' Hill lode, the Cice Pesos lode, the Sachofruto lode, the Aguas Claras lode, the old Aguas Claras, the Manta lode, the new Candelaria Mine, besides any that may be met with from time to time. In conclusion, I can only say that we must be very unfortunate if we do not now get a continuous supply of mineral that will yield a good profit.

A SHAREHOLDER: With respect to the Marmato, you say you have driven 25 fms.; what might be the total number of fathoms?——Mr. P. BRANDON said they could not tell that. It was a series of lodes going east and west and the drivings were going from south to north.

The SHAREHOLDER: Could you name any maximum?——Mr. P. BRANDON: I could not name it. We expect that before long we shall cut one or two of those lodes.——Mr. P. BRANDON, in reply to a further question, said that there had been an ample supply of water.

The resolution for the adoption of the report and accounts was then put and carried. It was then decided that the statement of Mr. Brandon should be printed and sent to the shareholders.

The retiring directors and auditors were re-elected.

A vote of thanks to the Chairman and directors closed the proceedings.

CAMBRIAN MINING COMPANY.

An ordinary general meeting of shareholders was held at the offices of the company, Palmerston Buildings, on Wednesday,

Mr. JAMES GREIVES in the chair.

Mr. GEORGE H. KEENE (the managing director) read the notice calling the meeting.

The CHAIRMAN formally moved the adoption of the report and accounts, which was seconded by Mr. HIRD.

Mr. GIRVIN said that although the company had been in existence three years, the shareholders had not yet received those favourable results which they had hoped for and expected. Therefore, he considered that up to this time the working of the company had not been satisfactory. He suggested that the directors should forego their fees till such time as the shareholders received a dividend. He also suggested that the utmost possible economy should be introduced into the London office expenses. He proposed that a small committee of shareholders be appointed to examine into the working expenses, and also to see what chance there is of increasing the revenue, so as to leave a fair return to the shareholders. He pointed out that in the past year they had lost 600*l.*

The CHAIRMAN said that as regarded the 600*l.*, the company had been unfortunate in this respect—that for December to March they were without water, which made a difference in the accounts of nearly 1500*l.* Of course, the directors could not help there being no water. They had not got the Robey's engine up so quickly as was anticipated, in consequence of the frost; had it not been for these causes the returns would have been greater than they had been.

Mr. GIRVIN said he did not blame the directors for any of these things.——Mr. HUGH MUNRO said he would be willing to second the resolution of Mr. Girvin. He thought the shareholders should have had more information about the parcels of ore sold.——The CHAIRMAN said every parcel of ore sold had been reported to the shareholders.

Mr. MUNRO said that no doubt that was the case, but it would be convenient if the amount altogether sold in the year were put in the report at the end of the year. Some time since he received information that 1500 shares were to be sold to the shareholders at the usual price of 2*l.* per share, and he understood the money was required for the purpose of getting the Robey engine, and for other works, but afterwards he got an intimation that the whole of the 1500 shares were sold, but he noticed that credit was taken for only 955 of those shares.

The CHAIRMAN said that, with respect to the shares, in the last account there were 10,558 shares unallotted; since then 1513 had been allotted, leaving a balance of 9045 shares unallotted, so that 1500 shares had been allotted, and also an odd 13.

A SHAREHOLDER said he had no shares allotted on the ground that they had been previously applied for and allotted.

A SHAREHOLDER said that many of the best parts of the mine could not be worked because they were making a communication between copper shaft and eastern shaft; if they had put a pick into copper shaft, which was full of water, the mine would have been drowned. During the last two or three days a communication had been made between the two, and copper shaft had been pumped out, and they had made a communication of 233 yards between copper shaft and eastern shaft. In three years they had done more than any other mine could have done. They had sunk the shaft and began to work the copper, and there were few mines which had done more than this mine in the time it had been worked.

A SHAREHOLDER said that the company had had unusual difficulties to contend with, and also an unusually bad market.——The CHAIRMAN said this was the case, and gave figures showing the fall which had taken place in the price of copper. He said that as a producing mine the mine was good enough, but the market had been against them. Now they had made the communication between the two shafts they would be able to work 200 ft. of ground.

Mr. J. FELL, who said he was the largest shareholder, referred to the loss which the company had sustained by the death of Captain Glanville, who could have explained better than any man the great difficulties with which the company had had to contend. He (Mr. Fell) was intimately acquainted with the mine, and he had no hesitation in saying that if the discovery had been made in Cornwall instead of Wales double the amount would have been asked for the property. During the greater part of the time that the company had been at work the copper shaft had been under water; but now the water had been drawn off all the levels. The main lode was standing untouched to the south of the workings. There had been a good deal of work done, of which the shareholders saw no record except in the cost sheet. For instance, there had been the sinking of the shaft, which had cost 600*l.*; and if this had been charged to capital (as he contended it should have been), instead of there being 600*l.* loss there would have been no loss at all. He might mention that the lode had been proved for 1¼ mile by costean pits. In the adjoining mine (Esgair Hir) they had made 150,000*l.* a-year profit, and 1,500,000*l.* worth of lead had been obtained in about 200 fms.

Mr. WILDE: Will Mr. Fell favour us by becoming a director?——Mr. FELL: My arrangements for the future will not allow me.

Colonel the Hon. T. G. CHOLMONDELEY (a director) said the directors had bestowed great pains in developing the mine thoroughly, and as economically as was consistent with efficiency, and he believed they had now arrived at a point at which profits were to be made.

A SHAREHOLDER asked whether at the present price of copper the mine would pay its expenses?——The CHAIRMAN: Yes. We have received a report this morning to the effect that the mine is going on as well as ever, and in some parts better.

Dr. HIGHET said he had seen the mine, and believed the shareholders had a splendid property. The copper was exceedingly rich, averaging 18 per cent. He hoped he should live to see the directors receiving 1000*l.* a-year each, and the managing director 1000*l.* a-year, and the shareholders receiving from 50 to 100 per cent. dividend. All that was required was that the mine should be worked with common sense and activity.

Mr. T. J. MONTGOMERY (a holder of 2000 shares) said the thanks of all present were due to Mr. Fell for his clear and interesting explanation. He (Mr. Montgomery) had seen the mine, which was in splendid order and very rich, and all they required to make it a success was a thoroughly energetic manager.

After some further discussion the resolution for the adoption of the report and accounts was put and carried.

A resolution was then passed increasing the remuneration of Mr. George H. Keene, the managing director, by 50*l.* a year. Several gentlemen bore testimony to the great attention which Mr. Keene paid to the duties of his office, and his courtesy to all shareholders asking for information.

Col. the Hon. T. G. Cholmondeley was then re-elected a director, and Mr. E. Ashmead was re-appointed auditor.

The meeting then broke up.

WHEAL BASSET MINING COMPANY.

A general meeting of adventurers was held at the mine, on Tuesday, Mr. MCKEAND in the chair.

Mr. R. MARTYN (the purser), read the notice convening the meeting, and the statement of accounts, showing—expenditure, 2995*l.*; receipts, 223*l.*; and a debit balance of 3090*l.* The report of Captain Trevena, after referring to the various points of operation, says:—Our surface operations include the laying down of flat-rods between Lyle's engine-shaft and Grace's shaft, the building of house and loadings for the air-compressor engines, and fixing the same, also the carpenters' shop and other erections, all of which have been carried out with due regard to economy and durability. I had hoped to have had our boring machinery in full operation ere now, but it has taken much longer to be delivered from the foundry than we anticipated. I am pleased, however, to say that when finished it will be the most powerful erected in the county, and in the course of a short time we shall have it in full operation towards the object we started for—the flat lode.

The accounts were passed, and a call of 10s. per share was made, payable in two instalments, one in September, and the other in October.

Mr. WADDINGTON referred to one of the inducements upon which he and his friends had resolved on working North Basset—that the North Basset main lode in the 122, going west, was last reported, at the time of Overend and Gurney's failure, to be worth 15*l.* per fathom. They hoped now to find that lode again worth that amount, and perhaps a little more, because at that time tin was only 46*l.* per ton, whereas at the present time it was worth 51*l.* or 52*l.* If they cut that lode at the 132 as good as it was above—and he should be disappointed if they did not cut it better—by vigorous working with the boring machines in that end, they ought to open up quite sufficient to pay the costs of the mine. He did not say that they would absolutely do this, but his own belief was that there was an excellent chance of doing something good there, before they met with the flat lode. If this anticipation was realised he was not without hope that after the next meeting they would be able to do without a further call on the shareholders, or at any rate with only a small one.

Capt. TREVENA thought that they would find the bottom of Grace's shaft in the country. From the information he gathered from the miners who worked there, he believed the lift was down to the 130, and they calculated on driving some 9 ft. or 12 ft. to intersect the lode. There had been several rumours about it which did not always agree with each other, but he believed they would find a very large lode in the 120, although what the quality of it was remained to be proved. If the quality was there he had no hesitation in saying that looking at the size of the lode which was there, they would have a very good mine. They would see the 120 in about three weeks, and he should then be able to say more about it than he was now in a position to do.

Referring to the prospects of the metal markets, Mr. WADDINGTON said that it was probably not unknown to those present that vigorous efforts had been recently made in London by certain parties to depress the price of tin, and that to secure this end they had swept up all the tin they possibly could by doing their best to augment the imports. But he was glad to say the effort had not succeeded, and he did not believe it was going to. He had just received some information having reference to the decrease of stocks in New York during the last month, and the figures tended to verify his opinion of what the figure was likely to be. The decrease amounted to 690 tons, a large reduction out of the small stock which was held there, especially seeing the large consumption that was going on in that country. This showed very plainly what they might expect should this ratio of consumption continue for only a few months longer. On July 1 the stock in New York amounted to 2725 tons, the imports to Boston were 200 tons, New York 140 tons, to New York from Australia 150 tons, English tin 20 tons, making 510 tons, or a total of 3235 tons. The consumption was 11,000 tons. The exports to London—or the tin which was brought back by that great friend of mining who claimed the credit of all the increase that had taken place in prices, but he showed his desire in a strange way by selling tin at a less price than others—amounted to 100 tons, making altogether 1200 tons. The reduction in stocks was a very marked one and another three or four months at that rate would see the New York stocks wiped out altogether. There were 1535 tons to arrive from the Straits and Malacca, but during all this time the consumption was going on, and he contended that notwithstanding the attempts that were made to show an increase of stocks in London, good progress was really being made in the trade. When confidence was once restored they knew how rapidly things improved, and he hoped that by the time they were ready to return tin at Wheal Basset, they would be able to obtain 65*l.* or 70*l.* a ton for it. He trusted that Cornish mining would prove to be a long, lasting, and profitable industry.

The usual complimentary votes to the committee, purser, manager, and chairman, terminated the proceedings.

MINERS' ASSOCIATION OF DEVON AND CORNWALL.

EXCURSION TO WHEAL ELIZA.

When Mr. Robert Hunt, the keeper of the Mining Records, established the Miners' Association in 1859, for the study of the sciences which bear upon mining matters, and to bring the mining people of the county into acquaintance with mining operations as carried on in other parts of the world, as well as for the introduction of new inventions and new machinery, sanguine though he might have been at the time, he could hardly have anticipated that the success of the Association would have been so great that the students learning science under its auspices should have been so numerous as to form such a large gathering as were to be seen at Wheal Eliza on Tuesday last, where they resorted for their annual excursion, at the kind invitation of Capt. R. H. Williams and the adventurers of the mine. There are now thirteen centres of students between and inclusive of Penzance and Devonport, and while about 80 students were expected to join in the excursion, no less than 180 put in an appearance, and it was by far the largest gathering the Association has ever had on its annual excursion day. Mr. Richard Taylor, F.G.S., is the president of the Association, but he was unable to be with the students on Tuesday. They were, however, accompanied by Mr. J. H. Collins, F.G.S., the hon. sec., who has done much to advance the interests and further the progress of the Association for a good many years past, Mr. B. Kitto, the lecturer and assistant secretary, and the following teachers:—Captain Eddy, Pendeen; William Thomas, Tuckingmill; Prout and Harper, St. Agnes; Humphries, St. Just; J. Bickle and T. Bickle, Hayle; Burn, Wheal Vor; and Treglohan, Bowden, and Warren, Devonport.

On arriving at St. Austell the party were conveyed to the mine in wagonettes and an omnibus. The mine is situate about two miles east of St. Austell, on the Tregrehan estate, belonging to Major Carlyon. The day was very fine, and as the mine is somewhat unique in several respects the excursion proved not only a source of pleasure, but of a good deal of interest and instruction. To begin with Wheal Eliza, it is about the richest little mine in the county, and the students could find that the tinstuff on the floors would average 5 per cent. for tin, and this, too, coming from comparatively shallow levels. Mines in the West do not produce stuff that will average more than 2½ per cent. for tin. In many cases it is only 1½ per cent.; but the lodes in Wheal Eliza are about 4 ft. wide, while in Dolcoath they are, perhaps, 20 ft. In the second place, it did not take long to discover that the mine was very compact at surface, and admirably well laid out for returning tin cheaply. The tinstuff is emptied from the skip into a wagon and trammed along to a stone-breaker, through which it passes crushed, and falls into another wagon, weighed on a small weighbridge on its journey to the stamps, and is hauled up a tramway to the rear of the stamps, and there emptied, so that the stuff is never touched by shovel or sledge hammer after it enters the skip until it passes through the stamps. This, to begin with, looks something like "scientific mining."

The dressing-floors are arranged on a plan calculated to dress the tin in a most efficient and economical manner, and the buddle used, though very simple and very different to those used in the mines in the West, does its work very efficiently, as was proved by the poorness of the tailings. The buddles are, however, much assisted in their work by the coarseness of the grain of the tin, which is quickly precipitated and easily dressed. We found but one pumping-engine on the mine, which at present has just enough work to do, but a shaft is being cut down in the upper part of the mine, an engine-house is erected close by to receive a second pumping-engine, and a boiler-house is in process of building, and this engine when started will materially ease the engine now at work.

Capt. R. H. Williams kindly conducted the party over the mine, and he proved a most intelligent and instructive guide. They were shown a nice little horizontal engine from Mr. West's foundry condensing air for the ventilation of the mine, and were informed that it was intended to work a boring machine by a portion of this condensed air shortly. Another little engine works a sawmill, and, when necessary, a steam crane. Another engine, something like a donkey-engine, is used to draw the stuff from the shaft, which is being cut down, to which we have just referred. To this he attached a three-eighths of an inch iron wire rope, and it does its work most efficiently.

The odd thing is that these little engines, wide apart as they are, are all worked by steam from the boilers of the pumping-engine. There are four boilers here, and there is, therefore, plenty of spare steam, and it is carried in pipes placed in launders so packed and covered by tarred felt that there is little or no perceptible loss of steam. And while there is much efficiency in the details of the workings the comfort of the people employed have not been forgotten. They are not only protected for the most part from the weather, but they are provided with very clean and comfortable places wherein to take their food. There is a place for males and another for females employed at the surface, and each place is warmed by steam pipes, which also heat a flat stove whereon the workers warm their pasties in tins made for the purpose. In a field below the mine, perhaps about 400 yards distant from the engine-house, there is a set of buildings erected for the comfort and the convenience of the men working underground. There is a changing-house, "a dry," and a place wherein to keep their ordinary clothes hung up, their being passages between. The dry is heated again by steam from the boilers, and the men can always have warm water for washing purposes from the condensed steam. Altogether the arrangements at surface were much admired, and the cleanness and brightness of the machinery at work was not unnoticed, and we learnt that the secret of this was that the men in charge had prizes offered for the most industrious and careful in this respect. A number of the party went underground, and one thing that at once struck them was the excellent ventilation of the workings, through the air sent down by the condenser above. At some places the current of the air was so strong that they had their candles blown out.

About three o'clock a cold collation was served in one of the workshops, and a very enjoyable afternoon was spent.

FOREIGN MINES.

ST. JOHN DEL REY MINING COMPANY (Limited).—Advices received Aug. 3, ex Minho (s.), dated Morro Velho, July 2:—

GENERAL OPERATIONS.

GOLD EXTRACTED TO DATE.—The produce for the second division, nine days, June, 1880, amounts to 8703·8 oits. = 1003·4065 ozs. troy. It has been derived as follows:—

	Oits.	Tons.	Oits. per ton.
General mineral	4,409·5 from	840	= 5·249
ditto Cotesworth—E. shallow	809·5 ,,	169	= 5·322
Mineral free from killas	2,485·5 ,,	331	= 7·509
	7,804·5 ,,	1340	= 5·824
Re-treatment	899·3 ,,	—	= 0·671
Total	8,703·8 ,,	1340	= 6·495

Equal to 7·488 oits. per ton.

The above is at the rate of 967 oits. per diem.

MINE.—Return of duty for 12 working days:—

Mineral raised from the mine	2213 tons.
Mineral quarried per borer per diem	1·62 ,,
Average attendance of borers daily	113·66 ,,
Average attendance of natives daily	233·50 ,,

MEASUREMENTS FOR THE MONTH OF JUNE.

Sinking sump-shaft vertically	4 ft. 10 in.
Driving—Level 217 D	2 4
Level 277 A	32 2
Level 234 A	5 2
South Level 234 A	15 3

The eastern driving, 217 D, has been suspended, as no indications of an early change have been met with. No special change has occurred in the condition of the lode either east or west.

Total rainfall for June ..... 0·13 in.

Advices received Aug. 14, 1880, per Douro (s.), dated Morro Velho, July 18:—

GENERAL OPERATIONS.—In both the mine and reduction departments the result for the past month is less favourable, in consequence of the observance of the many Midsummer native feast days, whereby both the amount of mineral raised and treated is less than that for the preceding month. The average yield per ton differs but little from that of the previous return.

GOLD PRODUCE FOR THE MONTH OF JUNE.—The gold obtained during the above period amounts to 27,927·2 oits., equal to 3219·5518 ozs. troy. It has been derived as follows:—

	Oits.	Tons.	Oits. per ton.
General mineral	14,447·6 from	2713	= 5·325
ditto Cotesworth—E.	2,387·1 ,,	598	= 4·060
Mineral free from killas	7,996·1 ,,	1067	= 7·494
	24,830·8 ,,	4368	= 5·685
Re-treatment	3,096·4 ,,	—	= ·708
	27,927·2 ,,	4368	= 6·393
Add recovered scrapings from crucibles, &c.	40·3		
Total	27,967·5		

As above explained, the quantity of mineral treated is less by 646 tons.

COST AND PROFIT.

Produce for June	27,967·5 oits.	
Less loss on melting	113·6	
	27,853·9, at 7s. 9d. per oit. =	£10,793 7 3½
Cost		7,177 10 10½
Profit		£ 3,615 16 13

MINE.—Mineral raised from the mine ..... 4575 tons
Mineral quarried per borer per diem ..... 1·56 ,,
Average attendance of borers daily ..... 117·04 ,,
Average attendance of natives daily ..... 238·32 ,,

EASTERN SECTION.—In the sump no special alteration has taken place, the proportion of pure lode and killas being the same as last reported.

West of the sump and adjacent west section stoping operations have been confined to the advance of the forebreast.

SECTION 277 D.—Towards the end of the month the poor zone of killas, section 256, was passed through, and the continuation of the pyritic zone, section 277 C, intersected. Present width of pure lode 10 ft.

EASTERN RESERVES SECTIONS.—These stopes have yielded an average supply of good mineral, where the lode continues without change. As these stopes become deepened, so the width of the pyritic body proportionately increases; width at lowest horizon, 14 feet.

WESTERN SECTION.—The return of high grade mineral from sections 276 "D" and 277 "C" has been fully maintained, without any alteration in the previously reported condition of the lode.

WESTERN LEVELS.—The exploratory level has been advanced with the view of discovering any mineral that may exist west of the Panella slide. At the same horizon, level south (20° east) has been driven 15 feet through nearly equal parts of fair mineral and killas.

PERMANENT MACHINERY.—It will be seen from both the mine and mechanic's report for the month that good progress has been made. Level 277 "A" was communicated with the "B" shaft on the 6th inst. At the point of communication it has been decided to widen the brow of the "B" shaft to admit of the required sidings for the tram wagons.

To avoid the excavation of a large piece of ground on the south side of level 277 "A" for the original site of the incline hauling-engine another position has been selected on the upper western part of section 257 "C," about 4 fathoms above.

CUIABA—GOLD PRODUCE FOR THE MONTH OF JUNE.—806 oitavas, from 308 tons, equal to 2·616 oitavas per ton.

PRODUCE, COST, &C.

Produce as above	806·0 oits.	
Less loss on melting	6·2 ,,	
	799·8 oits., at 8s. 1d. per oit. =	£323 5 0½
Cost		878 15 11½
		£555 10 10¾

The above produce has been derived as follows:—

	Oits.	Tons.	Oits. p. ton.
First division, 15 days, Serrote section	409¼ from	162	= 2·526
Second ,, 15 ,, Fonte Grande	396¾ ,,	146	= 2·717

This is the highest yield per ton so far obtained from the Fonte Grande section, at which point the lode maintains its formerly reported size and quality.

Extension of deep adit for the month, 6 fathoms.

At surface fair progress has been made in the erection of the boring and stamping plant.

GOLD EXTRACTED TO DATE.—The produce for the first division of July (a period of 11 days) amounts to 10,814·6 oits., equal to 1246·7475 ozs. troy. It has been derived as follows:—

	Oits.	Tons.	Oits. per ton.
General mineral	7,206·0 from	1373	= 5·248
Mineral free from killas	2,732·5 ,,	392	= 6·971
	9,938·5 ,,	1765	= 5·631
Re-treatment	876·1	—	= 0·496
Total	10,814·6 ,,	1765	= 6·127

The above produce is at the rate of 983 oits. per diem.

MINE.—Return of duty for 13 working days:—

Mineral raised from the mine	2613 tons
Mineral quarried per borer per diem	1·50 ,,
Average attendance of borers daily	124·28 ,,
Average attendance of natives daily	251·88 ,,

The gold troop, conveying six boxes of bar gold, weighing in all 29,446·2 oits., equal to 3394·6677 ozs. troy, was dispatched for Rio and England on the 16th inst.

N.B.—The gold has duly arrived.

TELEGRAMS RECEIVED.—On July 24—Produce eleven days (first division of July), 10,750 oits.; yield, 6 oits. per ton. Profit for the month (June), 3600*l.* All going on well.

On July 30—Produce nine days (second division of July), 8000 oits.; yield, 5·4 oits. per ton. All going on well.

On Aug. 9—Produce for the month (July), 26,500 oits.; yield, 5·5 oits. per ton.—Cuiabá: 350 tons stamped; yield, 2·2 oits. per ton.

SENTEIN.—Aug. 14: The manager reports as follows: The following work has been done at the mines and dressing floors during the past fortnight: St. Barbe level has been extended 22 ft.; no alteration in the lode. No. 4 end has been driven 17 ft., the lode composed of carbonate of lead and gossan, worth 2½ tons of carbonate of lead to the fathom. Stopes in the carbonate are worth about 4 tons per fathom. We have removed many of our miners from the stopes in the galena to stope in the carbonate, as we find it much cheaper and easier to break the ore in the latter than in the former place. We have recommenced the driving of the No. 3 St. Eugenie end; at the present moment it is rather poor, but we hope soon to find a change for the better here. Some short time since, when in inspecting the lode at surface we came across a place which showed very favourable indications for ore, and we put on immediately six miners to drive, and I am pleased to say we have found a branch of lead ore 5 or 6 in. wide, and which we consider of a very promising nature. This place is several hundred metres further west than our main workings. The stopes, on the whole, are of the usual value. We have been obliged to change one of the conducting lines of the wire-rope, which has delayed us several days, but is now again in full operation, and working better than ever it did. We anticipate that in future we shall be able to bring down 70 to 80 tons of mineral per day. We have dressed 180 tons of blende and 25 tons of lead during the past two weeks. The reason we have not dressed more lead was that we were too much encumbered with the partly dressed ore, so that we were obliged to put this mineral through the jigging-machines, and consequently we could not treat the ore which came from the mines. We expect that the lower section of the lower floors dressing machinery will be finished by the end of this week.

[For remainder of Foreign Mines se's to-day's Journal.]

HADFIELD'S STEEL FOUNDRY COMPANY.

AWARDED THE ONLY GOLD MEDAL,

AT SYDNEY EXHIBITION, 1880,
FOR STEEL CASTINGS.

AWARDED THE ONLY GOLD MEDAL AT PARIS EXHIBITION, 1878, FOR CRUCIBLE STEEL CASTINGS. FIRST PRIZE MEDALS AT LEEDS, WREXHAM, AND MANCHESTER EXHIBITIONS 1875 AND 1876. AND THE HIGHEST AWARD FROM THE MINING INSTITUTE OF CORNWALL, 1878.

ATTERCLIFFE, SHEFFIELD,

MANUFACTURERS EXCLUSIVELY OF

Crucible and Cast Steel Castings,

FOR

Engineering & Mining Purposes,

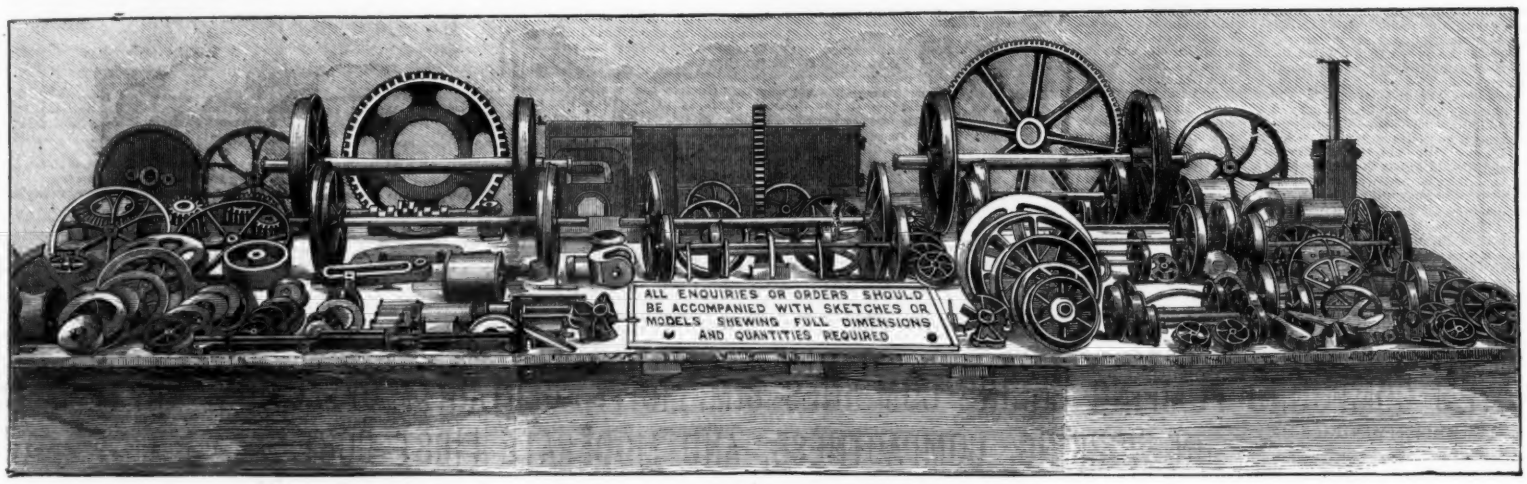
AND ARE THE SOLE MAKERS OF

AWARDED THE ONLY GOL D MEDAL,

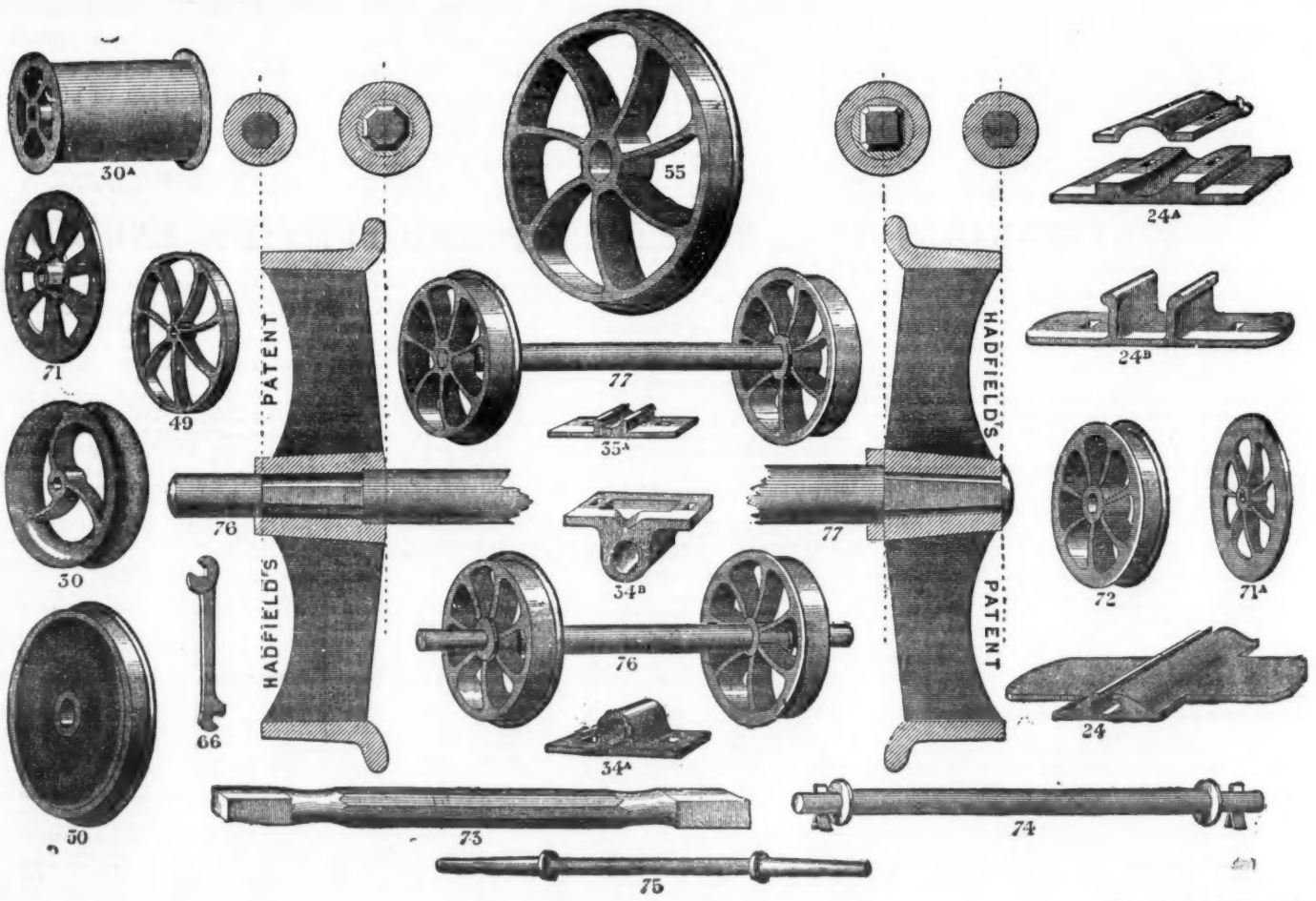
AT SYDNEY EXHIBITION, 1880,
FOR STEEL CASTINGS.

HADFIELD'S CAST STEEL WHEELS.

One of our departments is specially adapted for the manufacture of these Wheels (as shown below), for Collieries, Ironstone Mines, Slate Quarries, Ironworks, Lead Mines, &c., &c. We have made, and are now making, many HUNDRED THOUSANDS; and having Patented a New Method of Fitting Wheels upon axles, being cheap, effective, and expeditious, we can execute orders entrusted to us with promptitude, our capacity in this department alone being equal to about 2000 wheels per week.



N.B.—Prices per Set of Wheels and Axles, fitted complete, forwarded on receipt of diameter of wheel on tread, depth of tread, real gauge, and thickness of axles and rolling load.



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HADFIELD'S PATENT METHOD OF FITTING WHEELS UPON AXLES.

The advantages of the above system are that the Wheels being forced upon a Taper Square-ended Axle, by Machinery, and then riveted (the machine securing truth), it is impossible that they can come loose or get within gauge. They are very cheaply fitted on, and run exceedingly true.

We construct the Arms of wheels upon the curved principle (as shown in the drawings above), consequently the shrinkage or cooling of the Castings is not interfered with, thus securing the greatest advantages of our very strong material.

CRUCIBLE CAST-STEEL WHEELS, when cast by us, are made from one-third to one-half lighter than Cast-Iron. They cannot be broken while working, even with rough usage and will wear at least twelve times as long as Cast-Iron, thus saving animal and steam power, and reducing wear and tear immensely.

We would also draw special attention to our INCLINE PULLEYS and CAGE GUIDES the adoption of which will prove highly advantageous.

MACHINE MOULDED STEEL GEAR WHEELS OF EVERY DESCRIPTION.

PARIS EXHIBITION, 1878.

GOLD AND SILVER MEDALS AWARDED for Steam-Engines & Boilers, also the Special Steam Pump, and Compound Pumping Engine.

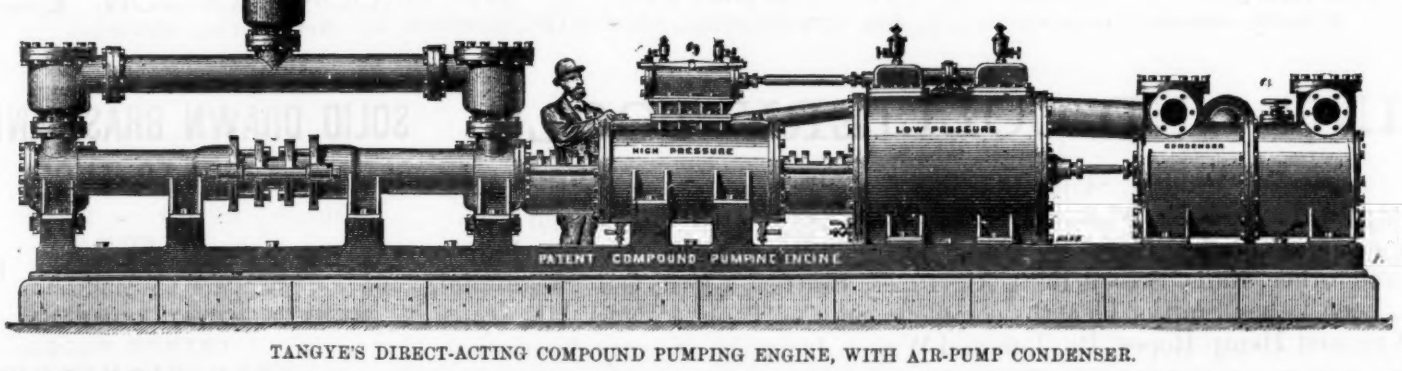
TANGYE BROTHERS AND HOLMAN,

CORNWALL HOUSE, 35, QUEEN VICTORIA STREET, LONDON, E.C.,
AND BIRMINGHAM, (TANGYE BROTHERS), CORNWALL WORKS, SOHO.

TANGYE'S DIRECT-ACTING
COMPOUND PUMPING ENGINE,

For use in Mines, Water Works, Sewage Works,

And all purposes where Economy of Fuel is essential.



TANGYE'S DIRECT-ACTING COMPOUND PUMPING ENGINE, WITH AIR-PUMP CONDENSER.

TANGYE'S COMPOUND PUMPING ENGINE COMBINES SIMPLICITY, CERTAINTY OF ACTION, GREAT ECONOMY IN WORKING, COMPACTNESS, AND MODERATE FIRST COST.

This Engine will be found the most simple and economical appliance for Mine Draining, Town Water Supply, and General Purposes of Pumping ever introduced, and as regards Mine Draining, the first cost is very moderate compared with the method of raising water from great depths by a series of 40 or 50 fm. lifts. No costly engine-houses or massive foundations, no repetition of plunger lifts, ponderous connecting rods, or complication of pitwork, are required, while they allow a clear shaft for hauling purposes. In this Engine the economical advantages resulting from the expansion and condensation of steam are very simply and effectively obtained. The steam after leaving the high-pressure cylinder is received into and expanded in the low-pressure cylinder, and is thus used twice over before being exhausted into the condenser or atmosphere.

The following first-class Testimonials will bear evidence as to the efficiency and economy of the Engine :—

TESTIMONIALS OF TANGYE'S COMPOUND PUMPING ENGINE.

$\frac{21'}{36}$ × 10" × 48" COMPOUND CONDENSING STEAM PUMPING ENGINE.

Newcastle and Gateshead Water Company, Newcastle-on-Tyne, Oct. 20, 1879.

Messrs. Tangye Brothers.

GENTLEMEN,—In reply to your enquiry as to the efficiency of the two pairs of Compound Condensing Engines recently erected by you for this company at our Gateshead Pumping Station, I have great pleasure in informing you that they have far surpassed my expectations, being capable of pumping 50 per cent. more water than the quantity contracted for; and by a series of experiments I find they work as economically as any other engine of the compound type, and will compare favourably with any other class of pumping engine. By the simplicity of their arrangement and superior workmanship they require very little attendance and repairs, and the pumps are quite noiseless. A short time ago I had them tried upon air by suddenly shutting off the column, and found they did not run away, thus showing the perfect controlling or governing power of the Floyd's Improved Steam-moved Reversing Vale. I will thank you to forward the other two pairs you have in hand for our Benwell Pumping Station.

Yours respectfully,
(Signed) JOHN R. FORSTER, Engineer.

$\frac{21''}{36}$ × 12" × 48" DOUBLE RAM COMPOUND CONDENSING STEAM PUMPING ENGINES.

The Chesterfield and Boythorpe Colliery Company (Limited), Registered Office, Boythorpe, near Chesterfield, Oct. 1, 1879.

Messrs. Tangye Brothers. Supplied in January, 1878.

GENTLEMEN,—Referring to the above, which we have now had working continuously night and day for the last 12 months, we are glad to say that it is giving us every satisfaction. It is fixed about 400 feet below the surface, the steam being taken down to it at pressure of 45 lbs. per square inch. We can work the pump without any difficulty at 28 strokes per minute=224 ft. piston speed. The pumping power is enormous. The vacuum in the condenser being from 11½ to 13 lbs. The pump is easily started, and works well and regularly. The amount of steam taken being much less than we anticipated. We consider the economy in working very satisfactory indeed. The desire for power and economy at the present day will certainly bring this pump into great requisition.

Yours truly,
(Signed) M. STRAW, Manager.

SIZES AND PARTICULARS.

Diameter of High-pressure Cylinder	In.	8	8	8	10	10	10	10	12	12	12	12	14	14	14	14
Ditto of Low-pressure Cylinder	In.	14	14	14	18	18	18	18	21	21	21	21	24	24	24	24
Ditto of Water Cylinder	In.	4	5	6	5	6	7	8	6	7	8	10	7	8	10	12
Length of stroke	In.	24	24	24	24	24	24	24	24	24	24	24	36	36	36	36
Gallons per hour approximate		3900	6100	8800	6100	8800	12,000	15,650	8,800	12,000	15,650	24,450	12,000	15,650	24,450	35,225
Height in feet water can be raised with 40 lbs. pressure per square inch in cylinder	Non-condensing	360	330	160	360	250	184	140	360	264	202	130	360	275	175	122
Ditto ditto	ditto—with Holman's Condenser	480	307	213	480	333	245	187	480	352	269	173	480	367	234	162
Ditto ditto	ditto—with Air-pump Condenser	600	384	267	600	417	306	335	600	440	337	216	600	459	293	203

CONTINUED.

Diameter of High-pressure Cylinder	In.	16	16	16	16	18	18	18	18	21	21	21	24	24	24	30	30
Ditto of Low-pressure Cylinder	In.	28	28	28	28	32	32	32	32	36	36	36	42	42	42	52	52
Ditto of Water Cylinder	In.	8	10	12	14	8	10	12	14	10	12	14	10	12	14	12	14
Length of stroke	In.	36	36	36	36	48	48	48	48	48	48	48	48	48	48	48	48
Gallons per hour approximate		15,650	24,450	35,225	47,950	13,650	24,450	35,225	47,950	24,450	35,225	47,950	24,450	35,225	47,050	35,225	47,950
Height in feet water can be raised with 40 lbs. pressure per square inch in cylinder	Non-condensing	360	230	160	118	456	292	202	149	397	276	202	518	360	264	562	
Ditto ditto	ditto—with Holman's Condenser	480	307	213	154	603	389	269	198	528	363	269	691	480	352	750	
Ditto ditto	ditto—with Air-pump Condenser	600	384	267	191	750	486	337	248	660	450	337	864	600	440	937	

PRICES GIVEN ON RECEIPT OF REQUIREMENTS.

Any number of these Engines can be placed side by side, to work in conjunction or separately as desired, thereby multiplying the work of one Pump to any extent.

NORTHERN DEPOT:—TANGYE BROTHERS, ST. NICHOLAS BUILDINGS, NEWCASTLE-ON-TYNE.

Printed by RICHARD MIDDLETON, and published by HENRY ENGLISH (the proprietors) at their offices, 26, FLEET STREET, where all communications are requested to be addressed.—*August 21, 1880.*